



North Carolina Department of Environment and Natural Resources
Division of Waste Management

Dexter R. Matthews
Director

Dee Freeman
Secretary

Beverly Eaves Perdue
Governor

June 9, 2010

Mr. Donald Long
Director
Solid Waste Management Department
City of Durham
1833 Camden Avenue
Durham NC 27704

Re: Solid Waste Compost Permit SWC-32-04

Dear Mr. Long:

Enclosed is your permit to operate a Large, Type I Solid Waste Compost Facility in Durham, North Carolina. Please carefully read all permit conditions. The operation manual submitted with your application has been incorporated into your permit. Your permit number is SWC-32-04 with an expiration date of June 9, 2015.

Mr. Chris Marriott, Environmental Senior Specialist, will be responsible for facility inspections. Mr. Marriott can be contacted at 336-771-5090. If you have any questions please feel free to contact our staff engineer Mr. Zi-Qiang Chen, Ph.D. at 919-508-8523, or myself at 919-508-8508.

Sincerely,

Michael E. Scott, Supervisor
Composting & Land Application Branch

cc: Chris Marriott, Environmental Senior Specialist, DWM
Zi-Qiang Chen, Ph.D., Composting & Land Application Branch
Central File, Solid Waste Section, Division of Waste Management

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WASTE MANAGEMENT
1646 MAIL SERVICE CENTER
RALEIGH, N.C. 27699

City of Durham, NC

is hereby issued a permit to operate a

LARGE, TYPE 1 SOLID WASTE COMPOST FACILITY


at

**2115 East Club Boulevard
Durham County, NC**

Permit Number SWC-32-04

in accordance with Article 9, Chapter 130A, of the General Statutes of North Carolina and all rules promulgated thereunder and subject to the conditions set forth in this permit.

6/9/10
Date


Michael E. Scott, Branch Head
Solid Waste Section

Facility: City of Durham Compost Facility
SWC Permit #: 32-04
County: Durham

Page 2 of 3

Permit Conditions:

1. Operation and maintenance of this facility shall be in accordance with the Solid Waste Compost Rules (15A NCAC 13B, Section .1400), the Permit Application and the Operation and Maintenance Manual submitted with the permit application, and these permit conditions. Failure to comply may result in compliance actions or permit revocation by the Division of Waste Management.
2. This facility shall be operated in such a manner that erosion and runoff from the site shall be controlled. Any leachate generated at the facility and any runoff from the facility shall be managed in such a manner that ground or surface water quality will not be adversely affected. Groundwater monitoring wells may be required if there is indication of the potential for groundwater contamination. The facility shall be maintained to prevent the accumulation of stormwater or leachate on travel areas or active composting sites.
3. Only materials specifically listed in the permit application may be managed at this facility. Before additional materials may be added, there must be adequate testing and prior approval by the Division of Waste Management in writing.
4. Compost temperature monitoring shall be conducted at a frequency adequate to assure the temperature requirements of Rule .1406(10) are met.
5. Compost or mulch produced from yard trash shall meet the pathogen reduction requirements of Rule .1406(10). Ground land clearing debris and ground material used as boiler fuel do not have to meet pathogen reduction requirements.
6. All compost produced at the facility shall meet the requirements of Rule .1407 of the Solid Waste Compost Rules and the permit application.
7. Testing and reporting shall be conducted in accordance with the requirements of Rule .1408 and the permit application. An annual report of facility activities for the fiscal year July 1 to June 30 shall be submitted to the Division by August 1 of each year on forms provided by the Division. This report shall include the amount of materials composted in tons.
8. The compost operation and the compost pad shall be operated and maintained with sufficient dust control measures to minimize airborne emissions and to prevent dust from becoming a nuisance or safety hazard.
9. Windrow data shall be maintained in writing as required to document temperatures,

moisture levels and turning intervals.

10. Wastes with low carbon-nitrogen ratios, such as grass clippings, shall be incorporated into windrows prior to the waste starting to compost (heat), create odors or attract vectors.
11. Windrow dimensions for incoming yard waste shall be limited to a maximum of 12' high x 25' wide unless otherwise approved by the Division. A 25' access shall be maintained between windrows for fire-fighting equipment. Active composting windrow dimensions shall be limited to a maximum of 7' high x 14' wide unless otherwise approved by the Division. Product storage dimensions shall be limited to a maximum of 10' high x 20' wide.
12. Windrow turning shall not occur without consulting weather forecasts for favorable conditions including temperature, wind direction, temperature inversions, and precipitation.
13. The odor management criteria shall be followed to minimize odors at the facility boundary. Upon receipt of a facility complaint the facility operator shall investigate and take action as necessary to minimize the cause of the complaint. A copy of all complaints regarding this facility shall be maintained for the duration of the permit including the operator's actions taken to resolve the complaints.
14. Feedstocks shall not be received that are in an anaerobic state.
15. The facility shall be operated in accordance with the Fire Management Plan.
16. The facility operational capacity for this permit shall be limited to 14,000 tons of feedstocks per year received for composting.
17. The level within the retention pond shall be maintained at or below 302.28 on the monitoring gauge. All discharges from the pond shall be reported to the Division. Any compromise of the retention pond liner shall be immediately repaired and reported to the Division. Maintenance of the retention pond shall be in accordance with the pond maintenance plan.
18. This permit shall expire on June 9, 2015. Changes in ownership, increase in facility capacity, or receiving feed stocks not identified in the permit application shall require a permit modification.

PERMIT TO OPERATE APPLICATION

**Solid Waste Compost Facility
City of Durham, North Carolina**



Prepared for:

City of Durham
Department of Solid Waste Management
1833 Camden Avenue
Durham, NC 27704

APPROVED

MES
6/9/10

March 2009

Prepared by:



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Raleigh, NC 27609

In association with:



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Section 1 Executive Summary

1.1 General

The City of Durham (city or Durham) operated a Large Type I Solid Waste Compost Facility (yard waste compost facility, compost facility, or YWCF) at 2115 E. Club Boulevard in Durham from 1992 until 2006. This application is for the issuance of a new permit for a smaller facility.

1.2 Durham Composting Facility Background

The City of Durham obtained a permit for a yard waste compost facility to begin operation in January 1992. The facility is located on a portion of the borrow area of the closed sanitary landfill which has an entrance at 2115 East Club Boulevard. The yard waste received at the facility is from both City Yard Waste vehicles and from the general public.

The North Carolina Department of Environment and Natural Resources, Division of Waste Management, issued Permit No. SWC-32-04 to the City for the operation of the yard waste compost facility on July 7, 1999. That permit expired in 2004. Operations at that facility ceased in September 2006. This application is for a new permit for a smaller yard waste composting facility on a portion of the old site.

1.3 Application Requirements Summary

This section summarizes the application requirements for a Small Type 1 facility as defined in 15A NCAC 13B.1402. The facility will handle approximately 1,800 cubic yards (CY) per quarter, which will not exceed the 6,000 CY/quarter threshold between Small and Large Type I facilities.

1.3.1 Area Plan

An area plan (scale 1" = 250'), showing all features required by 15A NCAC 13B.1405(a)(1), was prepared by the Durham City/County Geographic Information Systems (GIS) Department based on 2005 aerial photogrammetry (see Figure 1).

1.3.2 Site Plan

A site plan (scale 1" = 60'), showing all features required by 15A NCAC 13B.1405(a)(5), was prepared by a NC licensed land surveyor based on an October, 2006 site survey (see Figure 2).

1.3.3 Land Ownership and Zoning

The site of the yard waste compost facility is owned by the City of Durham, North Carolina. The compost facility is allowed within the existing zoning.

1.3.4 Siting/Design Requirements

Floodplains

No active composting, curing or product storage areas are located in a floodplain (see Figure 1).

Property Line Buffer

The compost area (Waste Management Unit, or WMU) is not within the 50-foot property line buffer requirement.

Residence Buffer

The compost area (WMU) meets the 500-foot buffer distance to residences or dwellings not owned and occupied by the permittee.

Well Buffer

The nearest well is more than 100 feet from the compost area (WMU).

Perennial Streams/Rivers Buffer

The compost area (WMU) is located greater than 50 feet from any perennial streams or rivers.

Surface Water Quality Standards

Ellerbe Creek is classified as a Nutrient Sensitive Class C waterway. All site runoff from storms up to and including the 100-yr, 24-hr storm will be captured on-site and a portion hauled off to the North Durham Wastewater Treatment Plant.

Closed Disposal Area

The facility is not located over a closed-out disposal area.

Adequate Access

The minimum required access buffer of 25 feet will be maintained for fire-fighting access to the compost areas within the WMU.

Surface Water Requirements

The City proposes to use an extended detention storm water management pond to capture and control the site runoff from the 100-year, 24-hour storm, and to haul a portion of that runoff to the North Durham Wastewater Treatment Plant.

Ground Water Requirements

The site is protective of groundwater standards (15A NCAC 2L) as a site investigation in 1991 (see Appendix B) indicated no presence of ground water within four (4) feet of the surface, and as no putrescible organic solid waste is accepted at the facility, leachate formation is minimal.

Public Access

The compost facility will not be open to the public during normal operating hours of the transfer station. Citizens delivering yard waste to the City's solid waste complex will deposit incoming yard wastes into designated containers (as is the current practice).

Sedimentation Pollution Control Law

In the event of land-disturbing activities at the Durham facility, silt fencing rock check dams and a temporary sediment trap will be used for sediment and erosion control. A permit has already been obtained from DENR's Division of Land Quality.

Air Pollution Control Requirements

The City of Durham yard waste composting facility is operated to be in compliance with the requirements of 15A NCAC 2D.1800 (Control of Odors).

1.3.5 Facility Engineering Plan

Section 3 of this Permit Application spells out the facility's design and engineering features, which are the same as the features used in the ongoing operation of the facility. The only construction activities contemplated at the Durham Compost Facility are: minor grading in portions of the site and construction of a storm water management pond.

1.3.6 Operations & Maintenance Manual

Section 4 of this Permit Application defines the operating procedures to be used at Durham Yard Waste Composting Facility.

1.3.7 Contingency Plans

Section 3.6 (page 16) spells out the contingency plans to be implemented in the event of equipment breakdown, air pollution/odor incidents, non-conforming waste, spillage and/or undesirable conditions.

1.3.8 Quality Assurance Plan

Section 3.7 (page 17) defines the Quality Assurance Plan for feedstock and process monitoring, sampling and analysis, and recordkeeping.

1.3.9 Product Marketing & Distribution

All compost produced by the facility will be used internally by the City. No compost will be made available for sale to the general public.

Section 2
Siting/Design Requirements
(15A NCAC 13B.1404)

2.1 Land Ownership & Zoning (15A NCAC 13B.1405(a)(2))

The City of Durham yard waste compost facility is a portion of approximately 260 acres owned by the City that is used for a wastewater treatment plant and a now-closed MSW landfill. The Durham City/County Planning Department has indicated that the site zoning of IL(D)/I(D) is suitable for a yard waste composting facility (see Appendix A).

2.2 Floodplains (15A NCAC 13B.1404(a)(1))

A portion of the permitted facility is located in the 100-year floodplain of Ellerbe Creek, a tributary to the Neuse River in the Falls Lake watershed. No active compost areas, curing areas, product storage areas, or other operational areas of the site are located within the 100-year floodplain boundaries or associated buffer.

2.3 Property Line Buffer (15A NCAC 13B.1404(a)(2))

The compost facility meets the 50' minimum property line buffer requirements. The facility boundary is 50' from the boundary of the compost area (Waste Management Unit). The property line is approximately 175 feet away from the facility boundary at its closest point.

2.4 Residence Buffer (15A NCAC 13B.1404(a)(3))

The nearest non-applidant owned and occupied residences are approximately 825 feet to the northeast of the compost facility.

2.5 Well Buffer (15A NCAC 13B.1404(a)(4))

The nearest well is greater than 200 feet from the compost facility.

2.6 Perennial Stream/River Buffer (15A NCAC 13B.1404(a)(5))

The compost facility is located approximately 1,250 feet away from Ellerbe Creek. The land between is heavily wooded and will remain undisturbed.

2.7 Surface Water Quality Standards (15A NCAC 13B.1404(a)(6))

The site is located in the Falls of the Neuse Reservoir watershed, near Ellerbe Creek. Ellerbe Creek runs along the Interstate 85 corridor, and drains 8.9 square miles of north Durham at this location. The entire stream from its source to Falls Lake is on the state's 303(d) list of impaired streams. The portion of Ellerbe Creek adjacent to the

site carries a Water Quality Classification of "C" (freshwaters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife) and is considered to be a Nutrient Sensitive Waterway (NSW). The Durham facility is more than 1,000 feet away from Ellerbe Creek.

2.8 Closed Disposal Area (15A NCAC 13B.1404(a)(7))

The facility is not located over a closed disposal area. The City's closed MSW landfill is on an adjacent property.

2.9 Adequate Access (15A NCAC 13B.1404(a)(8))

As the facility is part of a larger municipal public works complex, there are two roads (one gravel, one dirt) through the site to allow access by fire-fighting equipment. The minimum buffer requirement of 25 feet between compost areas and swales/berms will be maintained.

2.10 Surface Water Requirements (15A NCAC 13B.1404(a)(9))

The City proposes to use an extended detention storm water management pond to capture and control the site runoff from the 100-year, 24-hour storm, and to haul that runoff to the North Durham Wastewater Treatment Plant.

2.11 Ground Water Requirements (15A NCAC 13B.1404(a)(10))

All areas used for composting activities are native soil pads. As the facility will not accept putrescible wastes, only ground yard waste will be composted and pallets and clean woody waste will be ground into mulch. These wastes produce very little leachate during the composting process or as a result of grinding into mulch. In addition, a test pit dug at the site in 1991 (see Appendix B) did not find any evidence of a seasonal high water table within four (4) feet of the ground surface. Thus, no migration of potential pollutants to the groundwater table is expected.

2.12 Public Access (15A NCAC 13B.1404(c)(1))

The public will not be allowed to deliver yard waste or pick up composted materials at this facility. The entire municipal public works complex is secured by fencing and locked gating when it is not open.

2.13 Sedimentation Control Law (15A NCAC 13B.1404(c)(2))

Erosion and sedimentation control plans have been prepared for the grading and other minor construction work associated with this site and a permit has been obtained from NCDENR.

2.14 Air Pollution Control Requirements (15A NCAC 13B.1404(c)(3) and (c)(4))

The City composting facility is operated to be in compliance with the requirements of 15A NCAC 2D.1800 (Control of Odors). Please see Sec. 4.3.2 in the Operations Manual (page 22) for a discussion of odor control practices at the facility.

Section 3 Facility Engineering Plan (15A NCAC 13B.1405(a))

3.1 Area Plan

The area plan, showing all information required by 15A NCAC 13B.1405(a)(1), is presented in Figure 1.

3.2 Site Plan

The site plan, showing all information required by 15A NCAC 13B.1405(a)(5), is presented in Figure 2.

3.3 Facility Report

3.3.1 Waste Types and Quantities

Yard waste, consisting of brush, branches, leaves and grass clippings, delivered to the Durham compost facility over the past five years is summarized in Table 1:

Table 1
Incoming Yard Waste Tonnages

Month	2001	2002	2003	2004	2005	2006	2007	2008	
January	1,196.0	621.9	1,278.7	915.6	801.7	1,173.4	750.2	1,000.2	
February	1,127.0	794.4	724.7	611.5	568.4	761.0	563.7	797.9	
March	1,320.5	903.1	2,053.8	1,555.5	917.2	1,157.8	1,134.9	1,128.6	
April	1,440.4	1,614.0	2,139.3	1,668.6	1,563.5	1,431.3	1,550.8	1,294.6	
May	1,198.2	1,182.7	2,369.9	1,324.5	1,265.9	1,451.8	1,262.6	1,510.8	
June	1,104.2	763.1	1,648.0	1,185.4	1,152.2	1,243.9	935.0	933.1	
July	892.2	760.5	1,260.0	949.9	1,040.8	983.7	793.8	1,502.6	
August	1,072.3	715.6	1,402.2	1,065.8	1,083.4	872.3	1,450.4	822.6	
September	979.6	885.6	1,970.5	1,136.7	1,085.3	1,223.6	674.9		
October	1,123.5	886.4	1,642.8	1,046.4	941.0	962.9	745.5		
November	1,215.1	1,296.5	1,702.1	1,398.4	1,178.4	1,365.0	972.3		
December	1,045.4	1,343.0	1,269.4	1,050.7	1,231.7	1,237.3	1,152.0		
									Totals
Total	13,714.3	11,766.6	19,461.4	13,909.0	12,829.4	13,863.8	11,986.0	8,990.4	106,520.9
Average Monthly	1,142.9	980.6	1,621.8	1,159.1	1,069.1	1,155.3	998.8	1,123.8	1,156.4
Peak	1,440.4	1,614.0	2,369.9	1,668.6	1,563.5	1,451.8	1,550.8	1,510.8	2,369.9

The average monthly tonnage (1,156.4 tons/month) has been used for sizing the facility. Based on a field-measured bulk density of 500 lbs/cubic yard (when ground up) the average monthly volume of yard waste is 4,626 cubic yards. The highest three-month period of incoming yard waste tonnage was during March, April & May of 2003, when an average monthly tonnage (during that three month period) of 2,187.7

tons was received. Peak monthly volume was realized in May, 2003, when 9,480 CY of yard waste and storm debris was received.

3.3.2 Feedstock Storage and Pre-Processing

Incoming yard waste will be stockpiled in the Waste Receipt Area on a daily basis. On a daily basis, facility operators will push the waste, using front end loaders, into windrows, each a maximum of approximately 12' high by 24' wide by 200' long, spaced approximately 25' apart to allow room for fire-fighting equipment. Approximately four (4) storage piles will fit in the designated area after allowing for fire lanes.

At least once per week an outside contractor will come in to grind up the accumulated waste in the designated Grinding Area. Ground up material will then be formed into piles for temporary storage. Under average conditions, the contractor will have to grind about 213 cubic yards per day (most of this ground material will not be handled by the compost facility). The contractor will have to form two (2) temporary storage piles, each 25' wide x 10' high x 160' long. As these piles will only hold about 1.5 weeks of yard waste grinding quantities, that material which is not diverted to the Windrow Area #1 for composting will be moved off-site for use as boiler fuel or transferred to an off-site landfill.

3.3.3 Compost Recipe Development

As the Durham facility accepts only yard waste, the only issues with regard to composting recipe development are adjusting the Carbon: Nitrogen ratios in the spring season when grass clippings are a major portion of the yard waste stream and in the fall season, when the majority of the waste stream is collected leaves. In the summer, fall and winter, the City may explore the use of urea nitrogen fertilizer to adjust C:N ratios. The City will keep a stockpile of ground brush on-site for mixing with the spring season grass clippings wastes and will encourage citizens to practice Grasscycling in their yards to cut down on the quantities of grass clippings coming to the facility.

Table 1 contains seasonal compost recipes based on the use of urea. The seasonal distributions of yard waste constituents are based on literature values. The quantities in Table 1 are based on a capacities analysis of the designated Windrow Area #1, which indicated that designated area could only handle about 13% of the total yard waste stream (or about 150 tons/month).

Table 2
Compost Recipe

Notes:

Available capacity in Windrow
Area #1

	1,774.6 tons/year			
	<u>Spring</u>	<u>Summer</u>	<u>Fall</u>	<u>Winter</u>
Seasonal Quantity Distr.	40%	20%	30%	10%
Quantity per season (tons):	709.8	354.9	532.4	177.5
Quantity per month (tons):	236.6	118.3	177.5	59.2
Quantity per week (tons):	59.2	29.6	44.4	14.8
Seasonal Distributions:	<u>Spring</u>	<u>Summer</u>	<u>Fall</u>	<u>Winter</u>
Grass Clippings	35%	25%	10%	0%
Brushy Yard Waste	65%	75%	40%	80%
Leaves	0%	0%	50%	20%

MIX RATIO CALCULATIONS -

Spring

Example Weekly Recipe

INGREDIENTS	Urea	Brushy Yard Wastes	Grass Clippings	Leaves (Freshly fallen)	TOTAL MIX	TARGET
C (% AS IS)	0	53.0	41.0	37.3		
N (% AS IS)	46	1.0	3.0	1.5		
MOISTURE%	1	42.5	80.0	54.1		
UNITS IN MIX BY WGT (T)	0.0	38	21	0	59.2	
UNITS IN MIX BY WGT (LB)	0	76,899	41,407	0	118,307	
UNITS IN MIX BY VOL (CY)	0	154	83	0	237	
DENSITY (LBS/CY)	1600	500	500	200		
RELATIVE DENSITY	1.00	0.31	0.31	0.13		
	0.00	76899.33	41407.33	0.00		
POUNDS OF CARBON	0	40,757	16,977	0	57,734	
POUNDS OF NITROGEN	0	769	1,242	0	2,011	
C:N RATIO	0.00	53.00	13.67	24.87	28.71	20 TO 30
POUNDS OF MOISTURE	0	32,682	33,126	0	65,808	
NUMBER OF UNITS	0	76,899	41,407	0	118,307	
PERCENT MOISTURE					55.63	50 TO 65%

MIX RATIO CALCULATIONS - Summer

Example Weekly Recipe

INGREDIENTS	Urea	Brushy Yard Wastes	Grass Clippings	Leaves (Freshly fallen)	TOTAL MIX	TARGET
C (% AS IS)	0	53.0	41.0	37.3		
N (% AS IS)	46	1.0	3.0	1.5		
MOISTURE%	1	42.5	80.0	54.1		
UNITS IN MIX BY WGT (T)	0.2	22	7	0	29.8	
UNITS IN MIX BY WGT (LB)	400	44,365	14,788	0	59,553	
UNITS IN MIX BY VOL (CY)	0	89	30	0	119	
DENSITY (LBS/CY)	1600	500	500	200		
RELATIVE DENSITY	1.00	0.31	0.31	0.13		
	400.00	44365.00	14788.33	0.00		
POUNDS OF CARBON	0	23,513	6,063	0	29,577	
POUNDS OF NITROGEN	184	444	444	0	1,071	
C:N RATIO	0.00	53.00	13.67	24.87	27.61	20 TO 30
POUNDS OF MOISTURE	4	18,855	11,831	0	30,690	
NUMBER OF UNITS	400	44,365	14,788	0	59,553	
PERCENT MOISTURE					51.53	50 TO 65%

MIX RATIO CALCULATIONS -

Fall

Example Weekly Recipe

INGREDIENTS	Urea	Brushy Yard Wastes	Grass Clippings	Leaves (Freshly fallen)	TOTAL MIX	TARGET
C (% AS IS)	0	53.0	41.0	37.3		
N (% AS IS)	46	1.0	3.0	1.5		
MOISTURE%	1	42.5	80.0	54.1		
UNITS IN MIX BY WGT (T)	0.3	18	4	22	44.7	
UNITS IN MIX BY WGT (LB)	600	35,492	8,873	44,365	89,330	
UNITS IN MIX BY VOL (CY)	0	71	18	222	311	
DENSITY (LBS/CY)	1600	500	500	200		
RELATIVE DENSITY	1.00	0.31	0.31	0.13		
	600.00	35492.00	8873.00	44365.00		
POUNDS OF CARBON	0	18,811	3,638	16,548	38,997	
POUNDS OF NITROGEN	276	355	266	665	1,563	
C:N RATIO	0.00	53.00	13.67	24.87	24.96	20 TO 30
POUNDS OF MOISTURE	6	15,084	7,098	24,001	46,190	
NUMBER OF UNITS	600	35,492	8,873	44,365	89,330	
PERCENT MOISTURE					51.71	50 TO 65%

MIX RATIO CALCULATIONS -

Winter

Example Weekly Recipe

INGREDIENTS	Urea	Brushy Yard Wastes	Grass Clippings	Leaves (Freshly fallen)	TOTAL MIX	TARGET
C (% AS IS)	0	53.0	41.0	37.3		
N (% AS IS)	46	1.0	3.0	1.5		
MOISTURE%	1	42.5	80.0	54.1		
UNITS IN MIX BY WGT (T)	0.2	12	0	3	15.0	
UNITS IN MIX BY WGT (LB)	400	23,661	0	5,915	29,977	
UNITS IN MIX BY VOL (CY)	0	47	0	30	77	
DENSITY (LBS/CY)	1600	500	500	200		
RELATIVE DENSITY	1.00	0.31	0.31	0.13		
	400.00	23661.33	0.00	5915.33		
POUNDS OF CARBON	0	12,541	0	2,206	14,747	
POUNDS OF NITROGEN	184	237	0	89	509	
C:N RATIO	0.00	53.00	13.67	24.87	28.95	20 TO 30
POUNDS OF MOISTURE	4	10,056	0	3,200	13,260	
NUMBER OF UNITS	400	23,661	0	5,915	29,977	
PERCENT MOISTURE					44.24	50 TO 65%

Figure 1
Area Plan

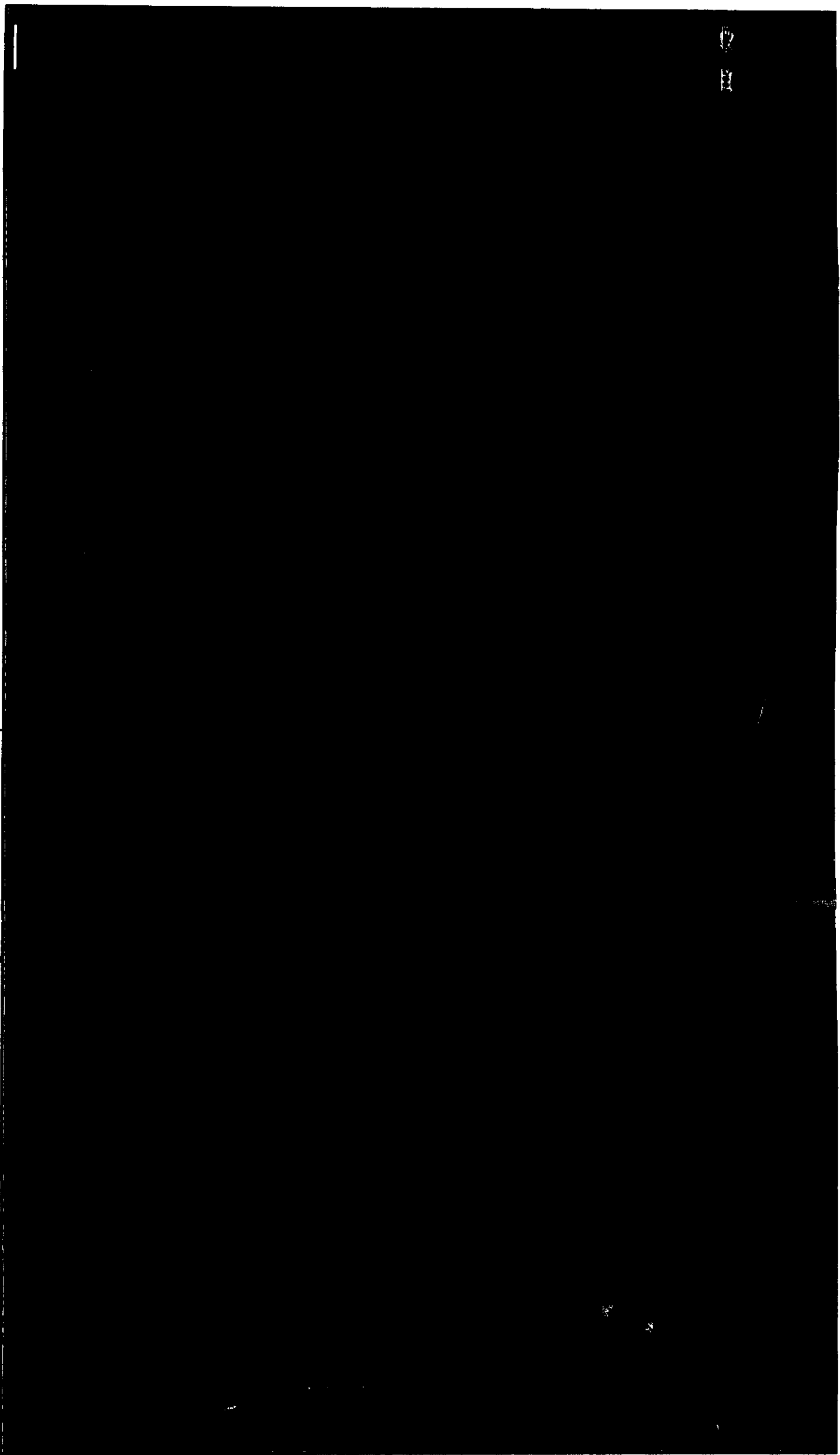
Figure 2
Site Plan

Scale: 1" = 250'


























Project
boundary

Existing
Access Point
roadway

Limit of Property
owned by city of Raleigh



Durham, NC
LEGEND

-  Durham, NC
-  Streams, and Ditches
-  DITCH
-  RIVER
-  STREAM
-  UNKNOWN
-  Highways
-  Parcels
-  Topo, 21FT
-  Building_Footprints_1994
-  FEMA_Flood_ZONES
-  1 PCT FUTURE CONDITIONS
-  A
-  AE
-  AEFW
-  AO
-  SHADED X
-  X
-  Surface_Water_Polygons
-  Municipal_Boundaries
-  Chapel Hill
-  Durham
-  Morrisville
-  Raleigh
-  Ortho_2005

Thursday, March 12 2009

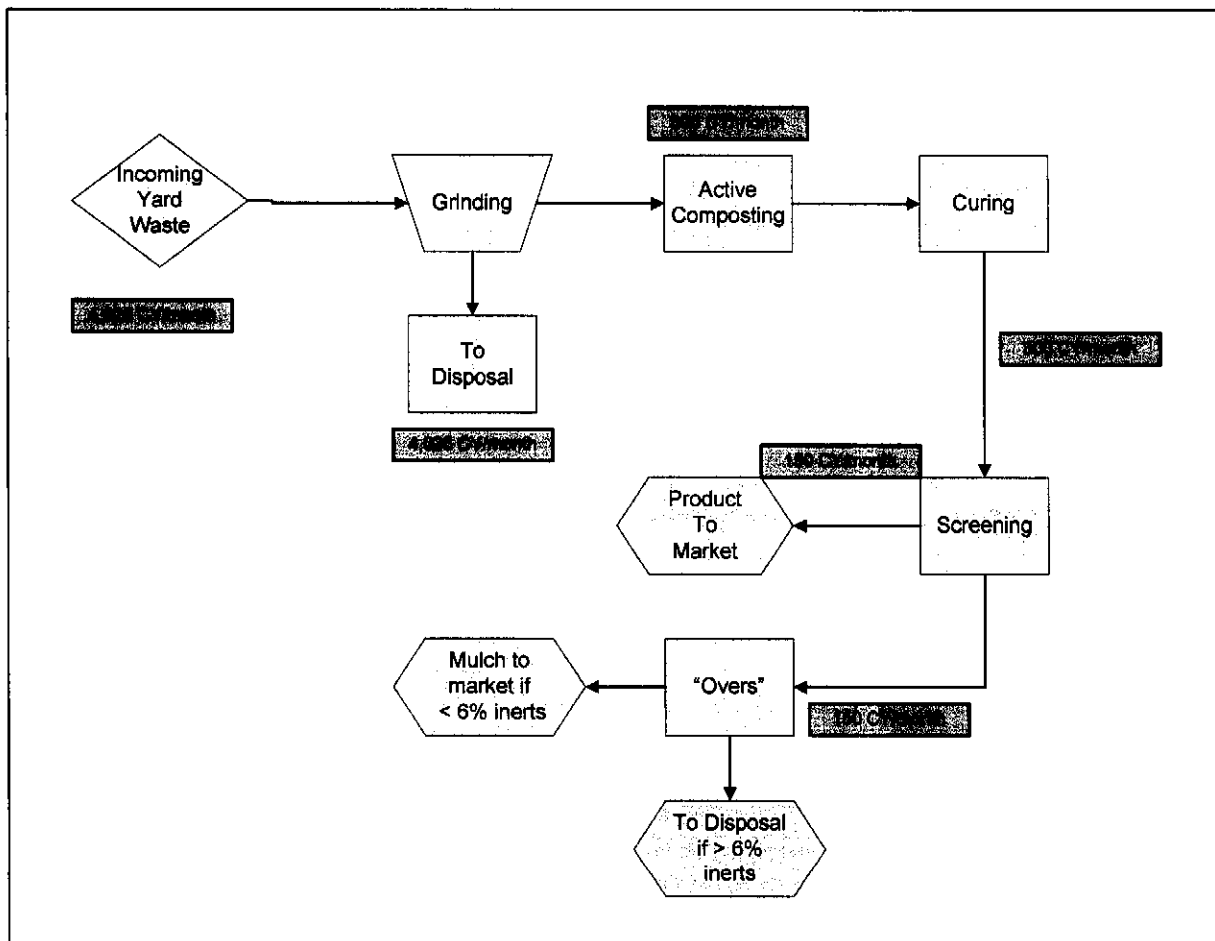
N



3.4 Compost System Process Design

A Process Flow Diagram of the Durham Composting Facility is presented in Figure 3.

Figure 3
Process Flow Diagram



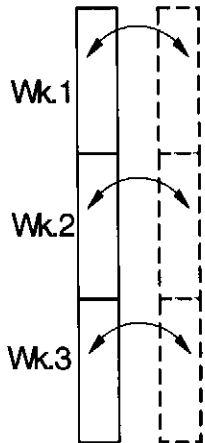
3.4.1 Grinding/Preparation

Incoming yard waste will be ground by a contractor using either a tub or horizontal grinder who will grind up accumulated yard waste materials every week. Under average conditions, the contractor will have to grind about 213 cubic yards per day. The contractor will have to form two (2) temporary storage piles, each 25' wide x 12' high x 200' long.

The contractor will grind all the incoming materials together. In the spring, with the higher percentage of grass clippings in the yard waste, the natural ratio of high-carbon brushy material to high-nitrogen grass clippings should be about 2:1. If the site operators observe higher amounts of grass clippings in a load, they will “pre-mix” those clippings with previously-ground brushy material to help maintain the acceptable C:N ratios. In other seasons, with lesser grass clippings, this step will not likely be needed. The compost recipes in Table 2 call for the use of small amounts of urea fertilizer to adjust C:N ratios. This is the same procedure used by the Mecklenburg County Compost Central yard waste composting facility in Charlotte, NC (although they only add urea during the fall high-leaf waste season).

3.4.2 Active Composting

Composting will be done with the turned windrow method, where the windrows will be built with front end loaders and where windrows will be turned with a front end loader (FEL). Windrows will be turned a minimum of one (1) time in a 3-day consecutive period once windrow temperatures have reached 131° F (in accordance with the requirements of 15A NCAC 13B.1406(10)). Windrows will be turned weekly after that. Aeration in the windrows will be provided by turning and the passive “chimney” effect of air movement in a windrow with adequate porosity (35-50% free air space). Total windrow residence time is planned to be about six (6) months for both composting and curing.



Due to the size of the designated Windrow Area #1, the facility will only be able to process about 30 CY/day of freshly ground yard waste (the remainder will be shipped off-site for out-of-state landfilling or sold as boiler fuel or feedstock to another composting facility). Windrow Area #1 will be set up for thirteen (13) windrows, each 7' high by 14' wide x 215' long. It will take about 3 weeks to completely build out a windrow so windrow turning will be done using the “open-space” turning method. In this method, a FEL is used to pick up the windrow and physically relocate it to an adjacent “windrow space”, mixing the material as the new windrow is reformed.

Wks 1-3 (typ.)

The City may elect to purchase a straddle-type windrow turner in the future to optimize the production space on the compost pad.

3.4.3 Curing

Curing will be done “in-place”, that is, the material will be left in the windrow after the active composting phase is complete. Windrows that have finished composting will be

combined for curing to utilize the volumetric shrinkage that occurs during composting to free up additional pad area for active composting.

3.4.4 Screening

Screening will be done by the Contractor with a vibratory screen. Screening rejects ("overs") will be stored in maximum 10' high piles in the Product Storage Area and will be used internally by the City of Durham.

3.4.5 Product Storage

Following final curing and screening, finished compost product is stored in the Product Storage Area (see Figure 2). This area is sized to hold six (6) months accumulation of product inventory. "Overs" will be stored in an adjacent storage area. Both the Product Storage Area and the Screened Overs Storage Area will be about 20' wide by 120' long and consist of a maximum ten (10)-foot tall pile of material covering the storage area. There is no need to windrow this finished material. If the "overs" contain less than 6% inert matter, they will be sold/donated as an "enhanced" mulch. If they contain more than 6% inerts, the "overs" will be disposed of at the Transfer Station. The percentage of inerts in the "overs" will be determined by the methodology specified in 15A NCAC 13B.1408(a)(5).

3.5 Environmental Controls

3.5.1 Storm water

Storm water management at the site will be provided by the construction of an extended detention pond sized to capture and control the runoff from the site arising from a 100-year, 24-hour storm (approximately 160,000 cubic feet). Runoff from areas upgradient of the compost facility will be re-routed around the facility by the use of swales and berms. Runoff water will be periodically pumped out and hauled to a wastewater treatment plant.

3.5.2 Erosion Control

In the event of any land-disturbing activities at the Durham compost facility, the City will contact DENR-DLQ regarding any needed permits.

3.5.3 Air Pollution

The only potential air pollutants generated at the Durham compost facility are odors and dust. Odors arising from the composting operation (as distinct from those arising from the nearby wastewater treatment plant) are minimized by following good composting management practices (i.e. promptly mixing grass clippings, keeping

moisture levels below 65%, and ensuring adequate porosity in the compost piles). The compost facility is in the middle of the 260-acre City property and there are significant buffer areas between the facility and the nearest residences (the closest is over 800 feet away, in the prevailing wind direction).

Dust can be generated during screening operations. The lack of any nearby neighbors and the presence of thickly wooded buffer areas around the composting operation minimize any risk of dust nuisance problems.

3.5.4 Noise

There are no sources of noise other than those associated with normal equipment operations (i.e. back-up beepers). Distances to off-site potential sensitive receptors are great enough to mitigate any noise before it reaches the property line.

3.6 Contingency Plans

3.6.1 Equipment Breakdown

The Durham Department of Solid Waste Management has existing contingency plans in the event of equipment failure, including: an on-site Master Mechanic, on-site support from the City's Fleet Management Department, availability of substitute equipment from other City departments, and the ability to lease equipment and/or services as necessary.

3.6.2 Air Pollution

Careful attention to operating practices is the key at Durham compost facility to minimizing any odorous air pollutants from the composting operation, including:

- Prompt grinding of accumulated yard waste and prompt inclusion of incoming grass clippings into windrows
- Proper mixing and windrow construction
- Avoiding windrow turning during temperature inversions with low wind speeds
- Covering any odorous material with either finished compost or wood waste

Dust is minimized by not screening during periods of high winds in the direction of the residence approximately 800 feet northeast of the screening area.

3.6.3 Non-conforming Waste

Any non-conforming waste arriving at the Durham Compost Facility must pass through two inspections: one by camera at the scale house, where vehicles are re-routed to the citizen and commercial drop-off areas of the solid waste transfer station to remove non-conforming waste before proceeding to the yard waste area; and visual

inspections by facility staff during the unloading process. Any non-conforming waste found during the unloading process is directed to an on-site 8-CY dumpster, which is periodically emptied at the Transfer Station.

3.6.4 Spillage

The Durham compost facility will not allow any wastes to be delivered other than yard wastes (branches, brush, leaves, clippings, etc.). No liquids or semi-solid solid wastes will be accepted, thus minimizing the potential for waste spillage. Non-conforming wastes arriving commingled with yard waste will be redirected to the Solid Waste Transfer Station further minimizing the potential for spillage on-site.

3.6.5 Undesirable Conditions

Undesirable conditions include fires, vectors, and odors (15A NCAC 13B.1405(a)(10)(B)). Odors have been addressed above.

In the event of fire, the personnel at the Durham Composting Facility have been trained to contact 911 and seek assistance from the local fire department.

Vectors (i.e. flies, mosquitoes, rodents, etc.) are a potential problem with mismanaged yard waste composting operations. Proper windrow management by regular turning will prevent rodents from nesting in windrows and by turning windrows, fly larvae and eggs are exposed to the higher interior temperatures of the windrows. Windrows should be turned weekly to break fly reproductive cycles. Mosquitoes and similar insects who breed in pools of standing water can be controlled by proper pad slope and drainage (at least 2%).

3.7 Quality Assurance Plan

3.7.1 Feedstock Monitoring

Incoming loads of yard waste are visually inspected for contaminants (plastic, metal and glass), which are removed manually.

3.7.2 Process Monitoring

3.7.2.1 Moisture

Moisture content of the yard waste compost will be monitored periodically with a "squeeze test". A handful of the fresh mix is squeezed into a ball in the hand; if water drips out it is too wet. If it crumbles apart after being squeezed, it is too dry. In the event of the material being too wet, the City will increase windrow turning frequency to enhance moisture evaporation. If the mix is too dry, the City will add moisture by either a water truck or by using potable water. Storm water from the on-site pond will not be used for moisture control.

3.7.2.2 Temperature

Temperatures are monitored in the composting windrows using a Reotemp™ 36" compost thermometer. Temperatures are monitored Mondays through Fridays (except for holidays) for at least the first seven to ten days to ensure that temperatures meet regulatory requirements. Temperature data is recorded on the Temperature Monitoring Form (see Section 4, Operations Plan). Any windrow not meeting the 15A NCAC 13B.1406 (10) requirement of 55° C. (131 F) or greater for three consecutive days will be torn down and the contents remixed with freshly ground yard waste, thus restarting the composting process.

3.7.3 Sampling & Analysis

The city will test the compost every six months for the parameters indicated in 15A NCAC 13B.1407 and 15A NCAC 13B.1408. Samples may be analyzed by the NC Dept. of Agriculture and by a local laboratory for pathogens and mercury content (these tests are not available from NCDA&CS).

After 90 days in a windrow, compost should be tested with a Solvita® test to see if it meets a compost stability standard score of "6" or more, indicating that the curing phase has begun. Solvita® test kits are available from www.solvita.com. Compost stability and maturity are important considerations for knowing when compost is ready to be used as a soil amendment. Stability refers to the degradation of the organic wastes used to make compost. Stable compost means the wastes have decomposed and no longer resemble the original material used in the mix. Solvita® is based on a gel-colorimetry technology in which respiration gases from composts are captured and accurately indicated in a color-coded system calibrated to a wide range of known conditions. The test measures carbon dioxide (CO₂) respiration and ammonia (NH₃) volatilization.

Testing of finished compost may also include other parameters for market support reasons.

3.7.4 Recordkeeping

In addition to temperature, moisture and stability data, plant operators will also track quantities of incoming yard wastes, dates of initial windrow formation, estimated composition of the windrow, turning dates, and approximate dates when the curing process began. Copies of all operational data, process monitoring logs and any compost lab analysis results will be kept on file in the operational log for the Durham compost facility. An Annual Report will be filed with NC DENR DWM by August 1st of each year, covering the period preceding between July 1 and June 30.

3.8 Product Marketing & Distribution

3.8.1 Markets

Under average monthly waste receipt conditions, the compost facility will produce approximately 150 CY each of compost product and screened overs ("enhanced mulch"). Any compost product not meeting the city's quality standards or the quality requirements in 15A NCAC 13B.1407 will either be recomposted with fresh feedstocks (depending on available pad space) or be used within the Public Works complex for applications such as vegetative enhancement of the final cover on the closed-out landfill, sediment and erosion control within the complex, etc., subject to specific usage approval by DENR-DWM.

The City will use the compost and mulch products for internal municipal uses.

In the event market conditions force an increase in product inventories at the compost facility in excess of one (1) year, and if on-site uses do not allow adequate inventory reduction, the City will negotiate an agreement for discounted wholesale distribution to one of the other major composting operations in North Carolina or provide material at no charge.

3.8.2 Distribution

The City will not distribute its products.

**Section 4
Operations Plan
(15A NCAC 13B.1406)**

4.1 General Facility Operations

4.1.1 Composting Overview

Composting is the controlled aerobic decomposition of organic materials by microorganisms into a stable, mature soil-like end product (compost). The City of Durham compost facility uses the turned windrow method of composting, wherein organic materials are mixed and formed into triangular-shaped windrows and turned periodically to reaerate the windrow, release heat and moisture, and to maintain porosity.

4.1.2 Contact and Facility Information

Any questions or correspondence regarding the Durham facility should be directed to:

Mr. Donald Long
Director, Department of Solid Waste Management
City of Durham
101 City Hall Plaza
Durham, NC 27701
Tel: (919) 560-4186
Fax: (919) 560-1228
Email: Donald.Long@durhamnc.gov

The compost facility is open Mondays through Fridays from 7:30 AM until 4:30 PM. On Saturdays, the facility is open from 7:30 AM to 12 Noon.

4.1.3 Access Control

Access to the Durham compost facility is limited to normal operating hours (see above). Outside of normal operating hours, the entire municipal public works complex is closed, with locked gates and video camera security at several points. The entire complex is fenced off to prevent unauthorized access.

4.1.4 Signage

Several signs containing the information required by NC DENR-DWM have been placed near the public entrance to the City's public works complex, indicating hours of operation, permit number and acceptable and non-acceptable wastes.

4.1.5 Fire Management

Fires can start in composting facilities through three primary mechanisms: spontaneous combustion in compost piles that have excessively low moisture content, carelessly discarded cigarettes/cigars, and fires caused by internal combustion engine malfunctions. Fire potential will be reduced at the Durham compost facility by careful attention to moisture content in the windrows, sizes of storage piles (less than 12 feet high by 26 feet wide and 200 feet long), enforcing a “no-smoking” rule at the facility, and preventive maintenance procedures on equipment. Fire extinguishers at the compost facility will be used in the event of equipment-related fires. In the event of fire, the local fire department will be called.

4.1.6 Health & Safety

The facility will be operated to ensure the health and safety of City staff, contractor staff and the general public at all times. Open burning is prohibited at the site and any fire observed will be handled using the facility’s fire management procedures. Fire extinguishers will be carried on all mobile equipment for use in the event of a fire involving a piece of equipment. All personnel at the compost facility will be trained in the safety procedures of the facility and of the City. The City of Durham has several health and safety policies currently in effect. These include:

<u>S201</u> - Safety and Health Policy	Records
<u>S202</u> - Monthly Safety Inspections of City Facilities	<u>S607A</u> - Access to Medical and Exposure Records
<u>S203</u> - Response to OSHA Complaints and Routine Inspections	<u>S701</u> - Fire Protection
<u>S204</u> - First Aid Kits	<u>S702</u> - Emergency Action Plan Policy
<u>S206</u> - On-the-job Accident Report	<u>S801</u> - Hand and Portable Power Tools
<u>S301</u> - General Safety Rules	<u>S802</u> - Ladders and Scaffolds
<u>S401</u> - Housekeeping Policy	<u>S803</u> - Lockout/Tagout
<u>S501</u> - Personal Protective Equipment	<u>S804</u> - Fall Protection
<u>S502</u> - Hearing Conservation	<u>S805</u> - Electrical Safety-Related Work Practices
<u>S503</u> - Respiratory Protection Policy	<u>S901</u> - Public Safety Personnel Policy
<u>S504</u> - Safety Shoe Policy	<u>S902</u> - Welding and Cutting Operations
<u>S601</u> - Airborne Contaminants, Pathogens and Carcinogens	<u>S904</u> - Trenching and Excavating
<u>S602</u> - Bloodborne Pathogens	<u>S906</u> - Handling of Materials
<u>S602A</u> - Bloodborne Pathogens	<u>S908</u> - Hazard Communications
<u>S603</u> - Chemical Hygiene in Laboratories	<u>S1001</u> - Vehicle/Equipment Maintenance Safety
<u>S605</u> - Injury and Illness Record Keeping	<u>S1002</u> - Trailer Tongue Jack Policy
<u>S606</u> - Airborne Contaminants, Pathogens and Carcinogens	<u>S1101</u> - Employee Driver's License Policy
<u>S607</u> - Access to Medical and Exposure	<u>S1102</u> - Operation of City Vehicles and Motorized Equipment
	<u>S1103</u> - Alcohol and Drug Testing Requirements for CDL Holders

All operations at the Durham compost facility will be conducted in accordance with these policies.

4.1.7 Recordkeeping Program

The Durham compost facility will maintain the following records in its operational records:

- Daily records of incoming yard waste
- Quantities of unacceptable wastes received (in tons) and the ultimate disposition of those wastes
- Estimated composition of the windrow
- Dates of initial windrow formation
- Turning dates
- Approximate dates when the curing process began.
- Temperature monitoring records for regulatory compliance
- Compost quality analytical laboratory test results, and
- Disposition of product that did not meet regulatory standards

An example of an operational log form is included in Table 3.

An annual report for the period from July 1 to June 30 shall be submitted by the City to the DENR Division of Waste Management by August 1 of each year. The report shall include:

1. The facility name, address and permit number;
2. The total quantity (in tons) and type of waste received at the facility during the year covered by the reports, including tons of waste received from local governments of origin;
3. The total quantity (in tons) and type of waste processed into compost during the year covered by the report;
4. The total quantity (in tons) and type of compost produced at the facility, by product classification, during the year covered by the report;
5. The total quantity (in tons) and type of compost removed for use or disposal from the facility, by product classification, along with a general description of the market during the year covered by the report; and
6. Temperature monitoring records to verify compliance with 15A NCAC 13B.1406(10).

Monthly reports, which contain daily logbook entries, as well as a copy of the annual report, will be kept in the official operating record in the City's Solid Waste Management offices.

City of Durham YWCF

Operational Log

Date _____

Operator _____

Waste Management

Amount of new yard waste in (CY) _____

Amount of unacceptable waste (%) _____

What happened to unacceptable waste? _____

New Composting Windrows

Windrow No.: _____

Which part? _____

First
third2nd
thirdLast
third

Date Windrow Built _____

What was windrow made of? _____

_____ % grass _____ % brush _____ % leaves

Amount of urea added (lbs) _____

Existing Windrows

Windrow #:

Turned? (Y/N)

Temperatures:

Location 1

Location 2

Location 3

Water Added? (Y/N)

Solvita Test Result

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>

Windrow #:

Turned? (Y/N)

Temperatures:

Location 1

Location 2

Location 3

Water Added? (Y/N)

Solvita Test Result

<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>

Product Management

Quantity Screened (CY) _____

Amount of compost (CY) _____

Amount of overs (CY) _____

Table 3
Example Operational Log

4.2 Compost Operations

4.2.1 Waste Receipt

Incoming waste shall consist only of yard waste, which is leaves, grass clippings, stems, pruning materials, small brush and biodegradable paper yard waste bags generated in residential and commercial lawn and garden care in the City of Durham, and clean wood waste including pallets. The waste is to be received and weighed at the scale house, and checked for unacceptable wastes. Any unacceptable wastes shall be removed by the customer and disposed of in the designated disposal container at the Recycling Center. Uncontaminated yard waste shall then be unloaded by the compost facility customer at the Waste Receipt Area.

At the compost facility, the site operator will conduct a second inspection of the incoming yard waste. Vehicles containing unacceptable waste will be rejected. Any extraneous unaccepted waste found while unloading or after the customer has left the site shall be placed into a dumpster at the composting facility.

Incoming yard waste will be stockpiled in the Waste Receipt Area on a daily basis. On a daily basis, facility operators will push the waste, using front end loaders, into windrows, each a maximum of approximately 12' high by 25' wide by 200' long, spaced approximately 25' apart to allow room for fire-fighting equipment. Approximately four (4) storage piles will fit in the designated area after allowing for fire lanes.

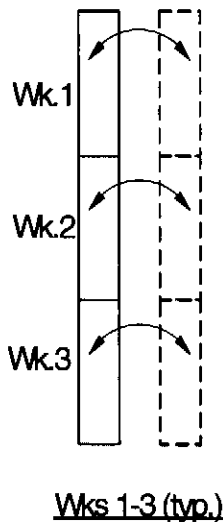
4.2.2 Feedstock Preparation

At least every week an outside contractor will come in to grind up the accumulated waste in the designated Grinding Area. Ground up material will then be formed into piles for temporary storage. Under average conditions, the contractor will have to grind about 213 cubic yards per day. The contractor will have to form two (2) temporary storage piles, each 25' wide x 12' high x 200' long. As these piles will only hold about 1.5 weeks of yard waste grinding quantities, that material which is not diverted to the Windrow Area #1 for composting will be moved off-site for use as boiler fuel or transferred to out-of-state landfills.

The contractor will grind all the incoming materials together. In the spring, with the higher percentage of grass clippings in the yard waste, the natural ratio of high-carbon brushy material to high-nitrogen grass clippings should be about 2:1. If the site operators observe higher amounts of grass clippings in a load, they will "pre-mix" those clippings with previously-ground brushy material to help maintain the acceptable C:N ratios. In other seasons, with lesser grass clippings, this step will not likely be needed. The compost recipes used by the City call for the use of small amounts of urea fertilizer to adjust C:N ratios.

4.2.3 Active Composting

Composting will be done with the turned windrow method, where the windrows will be built with front end loaders and where windrows will be turned with a front end loader (FEL). Windrows will be turned a minimum of one (1) time in a 3-day consecutive period once windrow temperatures have reached 131° F (in accordance with the requirements of 15A NCAC 13B.1406(10)). Windrows will be turned weekly after that. Aeration in the windrows will be provided by turning and the passive “chimney” effect of air movement in a windrow with adequate porosity (35-50% free air space). Total windrow residence time is planned to be about six (6) months for both composting and curing.



Due to the size of the designated Windrow Area #1, the facility will only be able to process about 30 CY/day of freshly ground yard waste (the remainder will be shipped off-site for out-of-state landfilling or sold as boiler fuel or feedstock to another composting facility). Windrow Area #1 will be set up for thirteen (13) windrows, each 7' high by 14' wide x 215' long. It will take about 3 weeks to completely build out a windrow so windrow turning will be done using the “open-space” turning method. In this method, a FEL is used to pick up the windrow and physically relocate it to an adjacent “windrow space”, mixing the material as the new windrow is reformed.

At some point in the future, the City may elect to purchase a windrow straddle-type turner to turn windrows and to optimize processing capacity on the compost pad.

4.2.4 Curing

Curing will be done “in-place”, that is, the material will be left in the windrow after the active composting phase is complete. Windrows that have finished composting will be combined for curing to utilize the volumetric shrinkage that occurs during composting to free up additional pad area for active composting.

4.2.5 Screening

Screening will be done by the Contractor with a vibratory screen. Screening rejects (“overs”) will be stored in maximum 10' high piles in the Product Storage Area and will be used for internal purposes by the City of Durham.

4.2.6 Product Storage

Following final curing and screening, finished compost product is stored in the Product Storage Area (see Figure 2). This area is sized to hold six (6) months accumulation of product inventory. “Overs” will be stored in an adjacent storage area. Both the

Product Storage Area and the Screened Overs Storage Area will be about 20' wide by 120' long and consist of a maximum ten (10)-foot tall pile of material covering the storage area. There is no need to windrow this finished material. If the "overs" contain more than 6% inerts, the "overs" will be disposed of at the Transfer Station. The percentage of inerts in the "overs" will be determined by the methodology specified in 15A NCAC 13B.1408(a)(5).

4.2.7 Process Monitoring

Moisture

Moisture content of the yard waste compost will be monitored periodically [at least how often?] with a "squeeze test". A handful of the fresh mix is squeezed into a ball in the hand; if water drips out it is too wet. If it crumbles apart after being squeezed, it is too dry. In the event of the material being too wet, the City will increase windrow turning frequency to enhance moisture evaporation. If the mix is too dry, the City will add moisture by either a water truck or by using potable water. The on-site storm water pond is not to be used for watering windrows.

Temperature

Temperatures are monitored in the composting windrows using a Reotemp™ 36" compost thermometer. Temperatures are monitored Mondays through Fridays (except for holidays) for at least the first seven to ten days after windrowing to ensure that temperatures meet regulatory requirements. Temperature data is recorded on the Operational Log (see Table 3). Any windrow not meeting the 15A NCAC 13B.1406 (10) requirement of 55° C. (131 F) or greater for three consecutive days will be torn down and the contents remixed with freshly ground yard waste, thus restarting the composting process.

4.2.8 Staffing

The City will provide a part-time attendant to oversee the facility and seek to retain a private contractor to handle most of the work in processing yard wastes and composting material.

4.3 Environmental Management

4.3.1 Surface Water Control

Surface water control is needed to ensure that rainfall-induced runoff that may be contaminated with waste materials at a composting facility does not cause water quality problems in nearby streams. Surface water control will be achieved with an extended detention or bioretention pond. This pond will be inspected by Facility staff daily. Inspection requirements will address the following at a minimum:

- Inspect plantings
- Settling, woody growth, animal burrowing, and signs of piping in the embankment
- Signs of seepage on the downstream face of the embankment
- Condition of wet detention basin floor, perimeter of the wet detention basin, and grass cover on the embankment
- Excessive erosion or sedimentation in or around the basin
- Riprap displacement or failure
- Principal and emergency spillway meet design plans for operation
- Outlet controls, inlet controls, debris racks, and mechanical and electrical equipment
- Inlet and outlet channel conditions
- Stability of slopes
- Safety features of the facility
- Access for maintenance equipment
- Signs of trespass or unauthorized traffic
- Sediment build-up

4.3.2 Odors

Odors (and air quality) will be managed in accordance with 15A NCAC 2D, Air Pollution Control Requirements, to minimize fugitive emissions and odors. Odors and dust are the two main air quality issues associated with composting. Odors will be minimized by careful attention to incorporating grass clippings into windrows within 24 hours of receipt, ensuring good porosity in compost windrows, and keeping moisture levels at appropriate levels. In the case of unusual odor conditions, a 6" blanket of finished compost will be placed over the windrows for absorption of odors. This will be accomplished by using a hydrostatic mulch blower and hose to apply an even layer of compost over the piles.

The key to controlling odors in composting is effective process control and composting management. The City of Durham will be certified as Technically Competent in Composting by the North Carolina Composting Council and will use this training to ensure minimal odors are present at the facility. To minimize the potential for an offensive odor episode, the staff will make sure that windrows stay aerobic, that no putrescible solid waste is present in the windrows, and that windrows are turned on a regular schedule consistent with the Operating Plan.

Should an off-site nuisance, odor event occur, the City will provide an emergency phone number for local residents to call. A 6" blanket of finished compost will be distributed over the windrows for absorption of odors. This will be accomplished by using a hydrostatic mulch blower and hose to apply an even layout of compost over the piles. The staff will then review operational logs and/or daily reports to determine what caused the odor event to occur.

4.3.3 Vectors

Vectors (i.e. flies, mosquitoes, rodents, etc.) are a potential problem with mismanaged yard waste composting operations. Proper windrow management by regular turning will prevent rodents from nesting in windrows and by turning windrows, fly larvae and eggs are exposed to the higher interior temperatures of the windrows. Windrows should be turned weekly to break fly reproductive cycles. Mosquitoes and similar insects who breed in pools of standing water can be controlled by proper pad slope and drainage (at least 2%).

4.3.4 Dust

Dust will be controlled by avoiding screening activities in dry, windy conditions. A water truck is available for dust suppression in severely dry weather.

4.3.5 Severe Weather Conditions

Operations at the compost facility will be covered by the City of Durham Adverse Weather Plan, which calls for cessation of waste collection activities during severe weather events. The solid waste transfer station, however, tries to remain in operation during most weather events. The compost facility is open whenever the transfer station is open. The Durham Solid Waste Adverse Weather Plan is provided in Appendix D.

4.4 Equipment Maintenance

All City equipment used in Solid Waste Operations is routinely maintained for proper performance with a very thorough Preventive Maintenance Program.

4.5 Site Maintenance

Maintaining the Durham YWCF site in a good operational condition is an important part of successful composting operations. Areas where site maintenance is important are: repairing eroded and rutted areas, maintaining site access roads, and in making sure the storm water pond operates properly.

Facility staff will conduct a "walk-around" inspection of the whole facility every morning. Problems will be noted in the operational log and repair work will be scheduled as soon as practicable. Eroded or rutted areas in the compost pad will be repaired with compacted fill dirt. Rutted area in the gravel access roads will be repaired with fresh gravel. For observed problems with the storm water pond, a qualified contractor will be called in.

Appendix A

Zoning Approval Letter from City of Durham



CITY OF DURHAM | DURHAM COUNTY
City-County Planning Department
101 CITY HALL PLAZA | DURHAM, NC 27701
919.560.4137 | F 919.560.4641

www.durhamnc.gov



October 2, 2006

Ted Lyon, Branch Head
Solid Waste Composting and Land Applications Branch
Solid Waste Section
Division of Waste Management
NC Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Subject: **Zoning and Subdivision Consistency Determination For:**
Yard Waste Compost Facility
Glenn Road, Durham, NC
PIN: 0843-03-34-9342, 0843-03-32-9488

Dear Mr. Fuller:

This letter is to confirm zoning consistency for the City of Durham's Type 1 Solid Waste Compost Facility (15 NCAC 13B.1400 etc.) permit application for the above referenced project. This office has reviewed the application and makes the following findings:

1. The property in question is zoned IL(D)/I(D).
2. The use of the facility as a yard waste compost facility is an allowable use pursuant to Section 5 of the Unified Development Ordinance.
3. The proposed use will be in compliance with all local zoning and subdivision regulations.

Should you have any questions regarding this matter, please contact the undersigned at (919)560-4137, ext. 223.

Sincerely,

Steven L. Medlin, AICP
Assistant Planning Director

Cc: Julia Mullen, Solid Waste
Teri Danner, Supervisor, Design Review

Good Things are Happening in Durham

Appendix B
Site Soil Test Report



**AGRICULTURAL
EXTENSION
SERVICE**

*North Carolina State University
College of Agriculture and Life Sciences*

Address reply to:
County Extension Office

721 Foster Street
Durham, North Carolina 27701
November 4, 1991

Nancy Clayton
City of Durham Sanitation Dept.
101 City Hall Plaza
Durham, N.C. 27701



Dear Ms. Clayton:

I visited the Durham City Landfill at 2115 E. Club Blvd. on October 30, 1991 for the purpose of evaluating the soil at the proposed composting site.

A pit was dug approximately 4 feet deep. I collected soil samples from the bottom and sides of the pit for textural classification and for evidence of water table levels. I determined that the sample was a loam soil. This was confirmed by Mr. Eddie Culberson of the Soil and Water Conservation Service.

There was no evidence that the water table was present or had ever been present at the bottom of the pit.

I am looking forward to working with you on this project.

Sincerely,

Carl A. Matyac, Ph.D.
Assoc. Agricultural Ext. Agent

Appendix C
Facility Sizing Report



3331 Glade Creek Blvd., Ste. 7,
Roanoke, VA 24012
(540) 904-2698
Fax: (540) 904-6732
craigcoker@cox.net
www.cokercompost.com

September 26, 2008

MEMORANDUM

To: Dave Koss, KCI
Fred Rash, KCI
From: Craig Coker
Re: Durham Yard Waste Composting Facility
Facility Sizing Report (Revised)

This memorandum outlines the facility sizing issues for the City's yard waste composting facility. It is a revision to my October 23, 2006 memo. It is based, in part, on new tonnage data received from the City on September 25 and on the site plan prepared by KCI dated February 28, 2008.

Incoming Waste Volumes

Tonnage data from the City was provided for the period of 2001 – present and is summarized below:

Month	2001	2002	2003	2004	2005	2006	2007	2008	
January	1,196.0	621.9	1,278.7	915.6	801.7	1,173.4	750.2	1,000.2	
February	1,127.0	794.4	724.7	611.5	568.4	761.0	563.7	797.9	
March	1,320.5	903.1	2,053.8	1,555.5	917.2	1,157.8	1,134.9	1,128.6	
April	1,440.4	1,614.0	2,139.3	1,668.6	1,563.5	1,431.3	1,550.8	1,294.6	
May	1,198.2	1,182.7	2,369.9	1,324.5	1,265.9	1,451.8	1,262.6	1,510.8	
June	1,104.2	763.1	1,648.0	1,185.4	1,152.2	1,243.9	935.0	933.1	
July	892.2	760.5	1,260.0	949.9	1,040.8	983.7	793.8	1,502.6	
August	1,072.3	715.6	1,402.2	1,065.8	1,083.4	872.3	1,450.4	822.6	
September	979.6	885.6	1,970.5	1,136.7	1,085.3	1,223.6	674.9		
October	1,123.5	886.4	1,642.8	1,046.4	941.0	962.9	745.5		
November	1,215.1	1,296.5	1,702.1	1,398.4	1,178.4	1,365.0	972.3		
December	1,045.4	1,343.0	1,269.4	1,050.7	1,231.7	1,237.3	1,152.0		
									Totals
Total	13,714.3	11,766.6	19,461.4	13,909.0	12,829.4	13,863.8	11,986.0	8,990.4	106,520.9
Average Monthly	1,142.9	980.6	1,621.8	1,159.1	1,069.1	1,155.3	998.8	1,123.8	1,156.4
Peak	1,440.4	1,614.0	2,369.9	1,668.6	1,563.5	1,451.8	1,550.8	1,510.8	2,369.9

The average monthly tonnage coming to the facility during the period of record is 1,156.4 tons. Peak monthly tonnage (May, 2003) was 2,369.9 tons but that tonnage is considerably higher than other peak month tonnages during the period.

These tonnages were converted to volumes using a field-measured (in October 2006) bulk density of 500 lbs/cubic yard:

<u>Month</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>		
January	4,783.8	2,487.6	5,114.6	3,662.6	3,206.6	4,693.7	3,000.8	4,000.9		
February	4,508.1	3,177.5	2,898.6	2,446.1	2,273.4	3,044.0	2,254.8	3,191.7		
March	5,281.9	3,612.2	8,215.2	6,221.8	3,668.6	4,631.0	4,539.6	4,514.5		
April	5,761.5	6,455.8	8,557.4	6,674.5	6,254.2	5,725.1	6,203.2	5,178.2		
May	4,792.8	4,730.7	9,479.5	5,297.9	5,063.7	5,807.0	5,050.4	6,043.3		
June	4,416.7	3,052.3	6,592.2	4,741.6	4,608.8	4,975.4	3,740.0	3,732.5		
July	3,568.7	3,042.0	5,039.9	3,799.6	4,163.4	3,934.6	3,175.2	6,010.3		
August	4,289.2	2,862.3	5,608.8	4,263.3	4,333.4	3,489.2	5,801.6	3,290.4		
September	3,918.3	3,542.3	7,882.0	4,546.7	4,341.3	4,894.6	2,699.4			
October	4,494.2	3,545.5	6,571.3	4,185.6	3,763.9	3,851.6	2,981.8			
November	4,860.5	5,186.1	6,808.5	5,593.4	4,713.5	5,460.0	3,889.3			
December	4,181.4	5,372.1	5,077.5	4,202.8	4,926.9	4,949.2	4,607.8			
									<u>Totals</u>	
Total	54,857.2	47,066.5	77,845.5	55,635.8	51,317.8	55,455.4	47,943.9	35,961.7	426,083.7	
Average Monthly	4,571.4	3,922.2	6,487.1	4,636.3	4,276.5	4,621.3	3,995.3	4,495.2	4,625.7	avg. monthly over period
Peak Month	5,761.5	6,455.8	9,479.5	6,674.5	6,254.2	5,807.0	6,203.2	6,043.3	9,479.5	highest volume in period
2nd Peak Month	5,281.9	5,372.1	8,557.4	6,221.8	5,063.7	5,725.1	5,801.6	6,010.3	8,557.4	2nd highest volume in period
3rd Peak Month	4,860.5	5,186.1	8,215.2	5,593.4	4,926.9	5,460.0	5,050.4	5,178.2	8,215.2	3rd highest volume in period

For the purposes of facility sizing, an average incoming monthly volume of 4,626 cubic yards has been used.

Incoming Waste Receipt

Yard waste arriving at the Durham YWCF will be off-loaded into the Waste Receipt Area and stockpiled for later grinding. A dedicated area of 35,600 SF is shown on the site plan for this function. Raw waste piles should be roughly formed into piles, no more than 12' high x 24' wide. The Waste Receipt Area capacity is as follows:

Waste Receipt Area

A. Available area = 35,600 SF

Deduct for portion of customer dropoff gravel lane

Deduct strip 10' W x 200' L = 2000 SF

$$\begin{aligned} \text{Net available area} &= \\ 35,600 - 2,000 &= 33600 \quad \text{SF} \end{aligned}$$

B. Waste Storage Piles

Assume maximum of 12' high

Use 2:1 width:height ratio

Maximum width = 24'

Area : use high parabolic formula (NRAES-114, p.11)

$$A = (2/3)(\text{base})(\text{height})$$

$$A = (0.667)(24')(12') = 192.096 \quad \text{SF}$$

Volume = Area x Length

$$\begin{aligned} V &= (192.096)(200) = 38419.2 \quad \text{Cubic feet} \\ &= 1422.9 \quad \text{Cubic yards} \end{aligned}$$

C. Capacity of Waste Receipt Area for average volumes

Allow a 25-foot fire-fighting access aisle between piles

Each pile = 24 feet wide

$$\text{Available width} = 178' - 10' = 168 \quad \text{ft}$$

Assume 4 piles, 3 aisles:

$$(4 \times 24' \text{ w}) + (3 \times 25' \text{ w}) = 171 \quad \text{ft.}$$

Available volume:

$$4 \text{ piles @ } 1,423 \text{ CY/pile} = 5691.7 \quad \text{CY}$$

$$\text{Average monthly volume} = 4625.7 \quad \text{CY}$$

Capacity:

$$5,691.7 \text{ CY} / 4,625.7 \text{ CY} = 1.230 \quad \text{months}$$

D. Capacity of Waste Receipt Area for peak volumes:

$$\text{Peak monthly volume of record} = 9479.5 \quad \text{CY}$$

Capacity:

$$5,691.7 \text{ CY} / 9,479.5 \text{ CY} = 60\%$$

The Waste Receipt Area will handle about 5 weeks worth of average incoming yard waste quantities, so weekly grinding by the City's contractor should be able to keep up with incoming volumes (allowing for inevitable downtime). Peak volumes of yard waste/storm debris, on the other hand, cannot be accommodated in this area, so another storm debris storage area will be needed.

Incoming Waste Processing

As I understand it, the City's contractor will mobilize on-site to grind accumulated yard waste every week. Based on average monthly waste receipt volumes, approximately 1,150 cubic yards of ground material will be produced weekly (based on an 5-day work week).

Grinding Area

$$\text{A. Available space: } 95' \text{ W} \times 200' \text{ L} = 19000 \quad \text{SF}$$

B. Average monthly grinding conditions:

Avg. monthly volume =	4625.7	CY/month
Grinding days / month =	20	days/month
Avg. daily grinding volume =	231.3	CY/day

Weekly grind volume =		
231.3 CY/day x 5 days/week =	1156.4	CY/week

Ground material storage requirements

Assume 10' H x 20' W piles, 160' long

A 10' x 20' pile has a capacity of 4.93 CY/LF

(Source: NRAES-114, p. 13)

Linear footage needed:

(1,156.4 CY/wk / 4.93 CY/LF) =	234.6	LF/wk
--------------------------------	-------	-------

Number of piles needed weekly:

638.9 LF/wk / 160' =	1.47	use 2 piles
----------------------	------	-------------

Area Needed Weekly:

Assume 25' aisles

Piles: 2 x 20' x 160' =	6400	SF
-------------------------	------	----

Aisles: 1 x 25' x 160' =	4000	SF
--------------------------	------	----

Total =	10400	SF/wk
---------	-------	-------

Capacity:

Assume 2,000 SF needed for grinder

Net remaining area = 17,000 SF

17,000 SF / 10,400 SF/wk =	1.6	weeks
----------------------------	-----	-------

C. Peak monthly grinding conditions:

Peak monthly volume =	9480.0	CY/month
Grinding days / month =	20	days/month
Avg. daily grinding volume =	474.0	CY/day

Weekly grind volume =		
474.0 CY/day x 5 days/week =	2370.0	CY/week

Ground material storage requirements

Assume 10' H x 20' W piles, 160' long

A 10' x 20' pile has a capacity of 4.93 CY/LF

(Source: NRAES-114, p. 13)

Linear footage needed:

(2370 CY/wk / 4.93 CY/LF) =	480.7	LF/wk
-----------------------------	-------	-------

Number of piles needed weekly:

480.7 LF/wk / 160' =	3.00	use 3 piles
----------------------	------	-------------

Area Needed Weekly:

Assume 25' aisles

Piles: 3 x 20' x 160' =	9600	SF
-------------------------	------	----

Aisles: 2 x 25' x 160' =	8000	SF
--------------------------	------	----

Total =	17600	SF/wk
---------	-------	-------

Capacity:

Assume 2,000 SF needed for grinder

Net remaining area = 17,000 SF

17,000 SF / 17,600 SF/wk =	0.97	weeks
----------------------------	------	-------

The grinding area has enough room to store about 1.5 weeks' worth of grinding production for average monthly volume conditions, but less than one weeks' worth of volume under peak conditions. This material should be moved from the grinder discharge belt and formed into piles using a front-end loader (FEL) with a large capacity bucket. The City's contractor will have to build two (2) piles (10' tall x 20' wide x 160' long) each week. In the event of a peak month (as in May, 2003), approximately 3 similarly-sized piles will have to be built each week. The City may wish to consider using additional front-end loaders to move material in the event of peak waste receipts.

Compost Area Sizing

The recommended process design for the City's facility is a three (3) month active composting period, followed by a three (3) month curing period. Following curing, compost would be screened (to a ½" or 5/8" particle size) for sale. The City will turn windrows with a straddle-type turner, so it is assumed windrows will be 7' tall by 14' wide. This size windrow has a capacity of 1.81 cubic yards of compost per linear foot of windrow.

The available area for windrow composting has been set by NCDENR. This analysis examines how much of the yard waste stream could be handled in this area:

A. Available area: 266' L x 220' W = 58595 SF
 Deduct 25' at each end for windrow machine turning radius
 Net available area: [(266'-25'-25') x 220'] = 47520 SF

B. Windrow Configuration:

Assume 7' H x 14' W windrows, placed 2' apart
 Width of windrow + aisle = 14 + 2 = 16 ft
 Area occupied by a single windrow:
 16' W x 216' L = 3456 SF
 Number of windrows on pad:
 47,520 SF / 3456 SF/windrow = 13.75
 Assume pad can be expanded to accommodate 14 windrows

C. Windrow Area #1

Volume of a single windrow (at initial formation):
 $V = A \times L = [(0.667 \times H \times B) \times L]$
 $V = [(0.667)(7)(14)] \times 216 = 14119.06$ CF
 Convert to Cubic Yards 522.93 CY
 Daily production from grinding area:
 1,154.6 CY/week / 5 days/wk 231.3 CY/day
 Time required to build one windrow:
 522.9 CY / 231.3 CY/day = 2.3 days
 Time required to build 14 windrows = 31.7 days
 Not enough time to allow combining of windrows
 due to volumetric shrinkage to free up more pad space

D. How much yard waste can be handled in Windrow Area #1

Incoming material from grinding	231.3	CY/day
Composting + curing residence time	180	days
Theoretical total volume of YW on pad for average monthly grinding production =		
231.3 CY/ day * 180 day res. =	41631.05	CY
Theoretical linear footage of new windrows needed		
41,631 CY / 1.81 CY/LF =	23000.58	LF
Theoretical area needed for windrows + aisles		
23,000.6 LF x 16' W =	368009.3	SF
Actual space available:	47520	SF
Percentage capacity of pad =	12.9%	
Average monthly grinding production =	4625.7	CY/month
Capacity of Windrow Area #1 -	597.3	CY/month
	29.9	CY/day

The area of Windrow Area #1 is only sufficient to compost about 600 CY/month (~ 150 tons/month) of yard waste. Windrow Area #1 can hold 13 windrows. The City could divert about 30 CY/day to composting and divert the rest (200 CY/day) to boiler fuel, or as a feedstock to another composting facility in the region.

Product Storage Area

The designated product storage area could be used for both screening and product storage. Alternatively, screening could be done near Windrow Area #1 and the Product Storage Area used solely for storage. Given the inability of Windrow Area #1 to absorb more than 12-13% of the incoming yard waste stream, the City should consider using the Storage Area solely for Product Storage.

The following analysis assumes the storage area is used for storage of both finished compost and for storage of ground yard waste destined for boiler fuel or for another destination:

A. Available area = ~ 140' x ~ 164' = 25544 SF

B. Assume area is divided into compost storage and boiler fuel storage

C. Compost Storage

1. Allow for 6 months storage volume
2. Compost production will be ~ 50% of incoming volume = 15 CY/day
3. Storage capacity needed:
15 CY/ day x 20 days/mo x 6 mos. = 1800 CY
4. Store in 10' H x 20' W piles
Capacity = 4.93 CY/LF
5. Pile footage needed:
1800 CY / 4.93 CY/LF = 365 LF
6. Plan on three (3) 120' long piles
7. Area needed:
3 [120 x 20] = 7200 SF
8. Area remaining for boiler fuel storage + equipment access:

18344 SF

D. Boiler Fuel Storage

1. Subtract for 20' W x 160' L equipment access road

$$18,344 \text{ SF} - 3,200 \text{ SF} =$$

15144 SF

2. Use 10' H x 20' W x 160' L piles

$$\text{Ground area of each pile} =$$

3200 SF

3. Allow for 25' spacing between piles for fire access

4. For pile width of 20' and access width of 25':

$$15,144 \text{ SF} / 45' =$$

336.5 LF

5. Volume capacity available =

$$336.5 \text{ LF} \times 4.93 \text{ CY/LF} =$$

1659.1 CY

6. Inventory storage time =

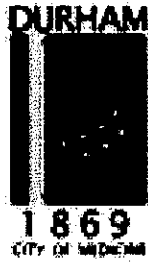
$$1659.1 \text{ CY} / 200 \text{ CY/day production} =$$

8.3 days

Under this scenario, the storage area will only have capacity for about 8 days production of ground yard waste to be used as boiler fuel, although it would have capacity for six months' compost storage.

Appendix D

Adverse Weather Plan



CITY OF DURHAM

DEPARTMENT

OF

SOLID WASTE MANAGEMENT

WINTER WEATHER PLAN

UPDATED: OCTOBER 4, 2006

APPROVED: _____

Donald Long, Director

Department of Solid Waste Management

GENERAL PROVISIONS

Effective Date: October 7, 2004

A Winter Weather Plan has been developed for planning and service coordination effective October 7, 2004, to be executed when directed by the City Manager or the Solid Waste Management Director.

PRIORITIES (RESIDENTIAL/COMMERCIAL)

Refuse collection services provided during adverse winter weather conditions will be conducted in the following priorities to ensure the safety, welfare and health of the citizens of Durham:

- FIRST:** Priority collection service will be given to hospitals, rest homes and restaurants.
- SECOND:** Collection will be provided to residents that are along major thoroughfares that can be traveled by collection vehicles.
- THIRD:** Collection will be provided to the remaining homes on the basis of safe travel along city streets.
- NOTE:** Service to exempt residents cannot be provided when snow and ice prevent safe collection.

PRIORITIES (TRANSFER STATION)

Adverse weather conditions at the Solid Waste Management Transfer Station and along the route to the City's transfer station may affect disposal operations in Durham. When the adverse conditions are in Durham, the collection of waste is prioritized. Operations that provide refuse disposal in adverse winter weather conditions will be conducted in the following priorities to ensure the safety, welfare and health of the citizens of Durham:

- FIRST:** Priority disposal service will be given to waste collected from hospitals, rest homes and restaurants. This type of waste is considered top priority for the community.
- SECOND:** The second priority adds the acceptance of household waste to the list of hospital, rest home and restaurant waste. No commercial, construction or industrial waste will be accepted until full disposal capacity has returned.

SCOPE

The primary responsibility for solid waste collection lies with the Solid Waste Management Department under the general supervision of the Director. The Solid Waste Assistant Director of Operations is assigned the responsibility of the direct supervision of the adverse winter weather collection plan.

The adverse winter weather plan is designed to effectively utilize and commit City personnel and equipment resources to provide the collection service during/after adverse winter weather conditions.

The type and extent of collection service will be dependent on the type of adverse winter weather, road conditions and the known or expected future weather conditions. As a general rule, the collection service will be provided to the maximum amount of collection points that can be reached safely in limited road conditions by City employees and vehicles. Response to specific conditions will be recommended by the Assistant Director of Operations and approved by the Department Director and/or City Manager.

The type and extent of disposal service will be dependent on the type of adverse weather, road conditions and the known or expected future weather conditions locally, at the receiving Transfer Station and along the route to the Transfer Station. As a general rule, the disposal service will be provided to as many vehicles as possible that are bringing waste that has been accepted according to the priorities above, and that can be transported safely during periods of hazardous road conditions by City and contractor employees and vehicles. Response to specific conditions will be coordinated with the Transfer Station Manager, the local CCC contractor representative, and approved by the Director or the Assistant Director of Solid Waste Management.

PRE-STORM PREPARATION

During periods of questionable weather, the Assistant Director of SWM operations will monitor local weather forecasts and communicate with the Public Works Department Street Maintenance Superintendent. When forecasts indicate the possibility of adverse winter weather, preparations will include, but are not limited to the following:

- *Notification of key personnel as designated at; See page 11.*
- *Notification and alert procedures for operating personnel.*
- *Fueling to full, maintenance check and operational check of all equipment and radio communications.*
- *Contact Public Information Office Beeper Number to be on standby for release of information.*

NOTIFICATION PLAN

The Adverse Winter Weather Plan is activated when weather conditions affect the normal operation of the Solid Waste Management Department. Employees need to be notified of the status of service provision in order to make preparations for work and arrangements for transportation to work. Notification follows the plan below.

EMPLOYEE NOTIFICATION

1. *The Director will notify Assistant Directors, Assistant to the Director, and Safety Officer.*
2. *Assistant Directors notify Commercial Supervisor, Management Assistant, Administrative Assistants and Supervisors.*
3. *Supervisors notify the Crews.*
4. *Employees without telephones should contact his/her supervisor ' if weather is questionable prior to the start of the regular shift.*

PUBLIC

1. *The Director calls/notifies the Office of Public Affairs and the City Manager's office or designee.*
2. *Recycling contractor is notified*
3. *Major private haulers are notified*
4. *Copies of the information for Press release shall be provided to the staff.*
5. *The Office of Public Affairs notifies media, coordinates information on the Info line and on the internet/intranet page.*
6. *Public Information includes information about changes in delivery of service schedule, as well as service of dead end streets, alleys and steep hills, etc.*

SAFETY PLAN

Employee Safety

1. *No backyard service.*
2. *No pickup of recyclables or yard waste.*
3. *Carts must be curbside and accessible.*
4. *Motor graders/bobcats must be used to clear entrance to the Transfer Station and the administration facilities.*
5. *Employees must be provided the appropriate PPE for winter weather operations.*
6. *Employees must be trained on operations during winter weather.*

Vehicle Safety

1. *Wipers must not be used until windshield is defrosted.*
2. *Drivers must clear all windows and mirrors on vehicles before operations.*
3. *Assistant Director of Operations and Supervisors determine which vehicles will be dispatched for collection services.*
4. *All Equipment Operators will perform vehicle and equipment Preventive Maintenance Checks and Services (PMCS) before, during, and after operations.*

Citizen & Property Safety

To ensure citizen safety and diminish loss of property, Solid Waste Management Department drivers must:

1. *Be alert to vehicles that are blocking roadways.*
2. *Avoid steep inclines.*
3. *Avoid dead end streets.*
4. *Be alert to children playing in snow and ice.*
5. *Know that alley pickups are prohibited.*
6. *SWM Department safety Officer will ensure snow and ice removal efforts are initiated for SWM property and facilities.*
7. *Sanding and salting of steep inclines at Transfer Station facility must be done by Solid Waste Management Transfer Station staff.*

EVALUATION OF ROAD CONDITIONS

1. *The Director of Solid Waste Management will check with Emergency Management and the Public Works Department regarding road conditions.*

- If road conditions are determined to be too hazardous, the Director will initiate the appropriate notification process for a possible delay of collection services. The Director, Assistant Director, Safety Officer and designated Solid Waste Supervisors will immediately assess the condition of collection routes and continue the assessment of these routes until collection operations are complete.*

ROUTE/SERVICE DETERMINATION

Schedule Changes:

Changes in employee schedules may be necessary to comply with changed collection schedules by customers.

Solid Waste Collection/Recycling Makeup Schedule:

If collection is canceled

Makeup Collection Day

Monday

Wednesday

Tuesday

Wednesday

Thursday

Saturday

Friday

Saturday

- If collection is canceled for more than one day there will be no make collection. Service will resume the following week.*
- The Transfer station will close if there have been no customers by 12:00 noon. The on site staff must notify The Director no later than 11:30 a.m. of status. The Director will determine the time of closure for the Transfer Station.*
- For adverse winter weather that develops during the day, the Director/Assistant Director will decide the degree of service and operating conditions.*
- If the winter weather event occurs and has an adverse impact on the Transfer Station facility operations, on Saturday, the Transfer Station Manager, Assistant Director/Director will determine whether the facility will be open or closed. Prior notification of this decision will be provided to the City Mangers office and office of Public Affairs.*

ALTERNATIVE COLLECTION OPTIONS

If collection is cancelled for two days, the following alternative collection option is available:

- Citizens who bring their waste to the Transfer Station during the week of reduced collection services will not be charged. The Solid Waste Management Department will cover these charges.

EMERGENCY CONTACT NUMBERS - SOLID WASTE MANAGEMENT

Name	Title	Work #	Home #	Mobile #
Donald Long	Director	(919) 560-4186	(919) 381-1882	201-0258
Thomas Ayers	Assistant Director	(919) 560-4186	(919) 544-7461	201-3169
Jay Reinstein	Assistant Director	(919) 560-4186	(919) 844-8987	961-4577
Christina Cates	Operations & Evaluations	(919) 560-4186	N/A	N/A
Phillip White	Safety & Training Officer	(919) 560-4186	(919) 231-1817	201-2911
Larry Webb	Commercial Collections Manager	(919) 560-4186	(919) 477-8078	605-5518
Stacey Poston	Clean City Division Manager	(919) 560-4186	N/A	452-1125
Corenta Evans	Acting Residential Collections Manager	(919) 560-4186	(919) 598-5455	201-3351
Waste Industries		(919) 405-1483		
Brunswick Waste Mgt.		804-848-9277		
Tidewater Fabric		(919) 957-8803		



ENGINEERS • SCIENTISTS • SURVEYORS • CONSTRUCTION MANAGERS

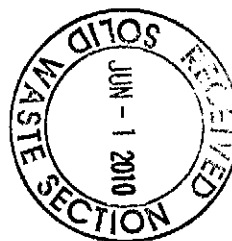
Landmark Center II, Suite 220 4601 Six Forks Road Raleigh, NC 27609 (919) 783-9214 (919) 783-9266 Fax

May 25, 2010

Division of Waste Management
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Attn: Mr. Michael Scott
Environmental Supervisor

Durham Yard Waste Facility
Permit # SWC-32-04
Construction Certification



Dear Mr. Scott:

In accordance with the terms and conditions of the permit issued by the DWM, I certify that the completed facility complies with the following requirements:

- 1) The design and construction complies with the Solid waste Compost Rules (15A NCAC 13B: Section 1400).
- 2) An erosion and sedimentation control permit was obtained and has been properly administered during construction.
- 3) All runoff from the yard waste site is being collected in the retention pond and is not being released from the site.
- 4) All corrective items listed from the pre-final inspection have been addressed by the contractor.
- 5) As-built drawings have been prepared and are included with this certification.

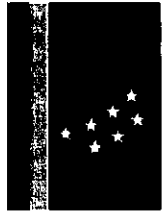
If you have any questions or need additional information, please let us know.

Sincerely,

A handwritten signature in black ink, appearing to read "DKoss".

David M. Koss, PE
Chief Engineer

DURHAM



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CITY OF MEDICINE

Durham Yard Waste Facility

Meeting Notes

May 17, 2010

A meeting was held Monday May 17, 2010 to discuss the operating permit for the Durham Yard Waste Facility. In attendance were:

City of Durham

Donald Long, Director of Solid Waste Management

Robert Williams, Asst. Director of Operations

Christina Tookes, Asst. Director of Budget and Administrative Services

Josephine Valencia, Waste Disposal Division Manager

Bruce Woody, Asst. Disposal Manager

Donna Maskill, General Services Construction Project Manager

NC DENR, Division of Waste Management

Michael Scott, Environmental Program Supervisor

Zi-Qiang Chen, Environmental Engineer II

Chris Marriott, Environmental Senior Specialist

KCI Technologies

Dave Koss, Vice President, NC Engineering Division

Ryan Lavinder, Civil Designer

King and Martin Properties

Bobby King, Owner/Manager

A preliminary site visit was made by NC DENR during the pouring rain, the meeting was moved to the administrative offices, then a more thorough site visit was conducted during a break in the rain.

Michael stated that he will need as-built drawings and certification that the construction was per print from KCI. Dave had a survey from Hine SiteWork (construction contractor) and will add to file documentation. Donna requested an electronic copy for the city. As-built drawings will show drainage pipe added and other changes. Chen requested a cross-section of the pond.

The City will make and post signs for the facility. Requirements are in NC DENR rules (Phone #, Permit #, Owner...) . Existing public instruction at the Scale House is OK since public does not go back to site. The

City will do an addendum to the Operations Plan. City will check the Storm Debris site to ensure that material is not in the 100 year flood plain per Michael's concern.

Michael requested documentation about Pump & Haul, especially the first time we haul. Dave said we are going to put a staff gauge at the pump box and that contractor is to shoot an elevation of the top of the box for the staff gauge. Discharge of the pumped pond water will be into the SWM Transfer Station Sanitary Sewer. The City has a DWQ Pump & Haul permit in place. Michael stated we must keep an eye on the weather; City and King & Martin will need to have documentation that we proactively pump the pond before a forecasted major rain event.

Bobby mentioned our proposed alternate use of the waste receipt, grinding, and windrow areas and Dave explained the use of on-site stockpiled soils in the waste receipt area resulting in a softer pad than required. The City will not be using the waste receipt area (first pad) until it firms up, which Dave said could take several years. Sufficient space is available in the grinding and windrow areas, and Michael said the as-built drawings are to reflect the actual use. The grinding area will be used for waste receipt and part of the windrow area will also be used for grinding.

We will not need to change the operations permit in the future if the first pad is used for overflow. The permit is for a maximum amount. We will have less than that for our Treatment and Processing Component. The Compost amount is not a major activity. Michael re-iterated that we won't see composting windrows for some time. The City is to keep any finished compost (clean final product) on a high separate pad (Product Storage Pad to the north) so it does not get run-off from incoming product contamination (dog waste and pesticides).

City and King & Martin will need to ensure that new material coming in is organized/windrowed where one pile is separate from other piles in case there is a problem. Per section 3.3.2 page 9 of the application for operating permit: "Incoming yard waste will be stockpiled in the Waste Receipt Area on a daily basis. On a daily basis, facility operators will push the waste, using front end loaders, into windrows, each a maximum of approximately 12' high by 24' wide by 200' long, spaced approximately 25' apart to allow room for fire-fighting equipment."

If City uses Material for public or City projects, it must be properly composted. It is OK to send it to a boiler or Novozymes or other composting site. City and King & Martin needs to record where the material is going. Charlotte is using as boiler fuel. City will have to fill out an annual report – Josephine has a form ready to go and asked if City is required to do independent lab testing to ensure no pathogens or sharps are in finished composted product. Michael stated City does not have to turn in reports, but how will we know if we don't test? Novozymes must test and produce documentation.

Michael asked about sediment pond maintenance. Dave said if we have a heavy concentration of silt/sediment, we have to look at it. Michael emphasized that the pond is Waste Water - we must put it in the sewer or on compost before the 3 day temperature curing. He recently got latitude on using it for

pre-curing windrow watering- if we ever do that, City would have to change the operation plan. But we are never to use it on the gravel roads. The fact that it is waste water is a federal code.

Dave stated that KCI would only take a couple days for the as-builts. A discussion of the pipe sizing was held, water backed up behind the 15" pipe during the unusual rain event at 1:30 Monday May 17, 2010.

Josephine asked about the temporary site, approval is expiring June 1st. Michael said to submit the temporary notification to extend time and that we should have approval by the end of the month for the permit to operate (NOTE: this was before the site visit, see below). Chris asked about the incoming and outgoing receipts. Incoming receipts are at the Scale House, and outgoing receipts will be filed there and also at the main office. Josephine will be the City of Durham contact for NC DENR. Bobby King is our operator.

Site Visit Notes

After the office meeting, a site visit was made with Chris, Chen, Michael, Woody, Donna, Dave, and Ryan during a break in the weather. The NC DENR folks walked the length of the dam and inspected the site. The torrential rain had uncovered problems that may not have been found until later. Dave said he would contact Hine SiteWork on the issues that were found:

Pond liner is torn at east inlet due to gravel truck driving on it when stone on liner was placed. Concern that water is flowing under liner at this point. "Blow-out" of dike on north side at dam – runoff bypasses dam and flows to back of property. Couple of silt fence overflows. Also rip-rap needed to divert or curb flow in a few places of torrential flow that is pushing gravel down into pond. There's about one foot of water in the pond.

Dr. Chen of NC DENR provided these comments via e-mail on May 17, 2010:

"We did identify some issues with the construction of the retention pond, especially of its liner: some segments of the bank grades are too steep to assure sheet-flow, one can see the surface channeling and cuts, gravel-retreating, and wide-observed liner exposure in the air (UV light)... Hopefully these and others will not bring you too much hassles and you'll take care of these soon"

Respectfully submitted on May 18, 2010,

Donna Maskill

Donna G. Maskill, PE
City of Durham, General Services Department
919-560-4197 x 21228
Donna.maskill@durhamnc.gov

Copy to all attendees via e-mail

DURHAM



CITY OF DURHAM

Department of Solid Waste Management

101 CITY HALL PLAZA 27701

1833 CAMDEN AVENUE | DURHAM, NC 27704

919.560.4186 | F 919.560.4647

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www.durhamnc.gov



March 12, 2009

Mr. Michael E. Scott
Supervisor
Compost & Land Application Branch
NCDENR
1646 Mail Service Center
Raleigh, NC 27699

Subject: City of Durham Solid Waste Composting Facility Permit Application and Wastewater Management Plan
Facility Permit Number: SWC-TBA

Dear Mr. Scott:

We have reviewed the comments from your letter dated February 23, 2009 and have made the following changes to our permit application.

I. General

1. Both the Permit Application and the facility's Wastewater Management Plan are considered engineering documents; therefore, the front page or cover of the documents should be signed, dated and sealed by an engineer licensed to practice in North Carolina. The signee is responsible for the enclosure of other related engineering work in the documents, such as the facility's Operation & Maintenance Manual, and facility sizing report if these segmented engineering reports are not originally signed, dated and sealed.

? *Response: The final permit application design documents will be signed and sealed by a Registered professional Engineer.*

II. Permit To Operate Application

1. Page 1, §1.1: Correct the typographical error -- fill the missing word "permit" - in the last sentence.

Response: We corrected the typo in paragraph 1.1 and added "permit". ✓

2. Page 1, § 1.3: The threshold between a small and large type I facility is 6,000 cubic yards of material per quarter (.1402(f)(7)). ✓

Response: We revised the threshold from 1000 cyds/quarter to 6000 cyds/quarter.

3. Page 1, §1.3.1: There is no such area plan with a scale of 1" = 175' in the submittal package. ✓

Response: An area plan is included (Figure 1, aerial photograph); a scale has been added.

4. Page 1, §1.3.1: Add scale, legend, and true north in Figure 1. The scale shall be less than or equal to 1 inch: 400 feet. On the scaled drawing (plan), show the location of all homes, wells, industrial buildings, public or private utilities, roads, watercourses, dry runs, and other applicable information regarding the general topography within 500 feet of the proposed facility.

Response: The area plan (Figure 1) has been modified to add a legend, north arrow, scale, etc. The adjacent development is shown on the aerial photograph. Most of the detailed site information is shown in Figure 2. ✓

5. Page 1, §1.3.2, and Figure 2: Provide the total acreages for the areas within the so-called "Waste Management Unit (WMU) Boundary" and the "Site-Development Boundary". ✓

Response: A site data 'box' has been added to the overall site plan to provide the total site area and other data such as the zoning, property area, FIRM map reference, and other important features.

6. Page 2, §1.3.4, Area Plan: Denote the well(s) on the plan.

Response: There are no wells in or near the yard waste facility; the nearest well is located 500ft from the project boundary and is shown on Figure 1. ✓

7. Page 4, §1.3.9, Figure 3 (Page 15), §3.4.4, Wastewater Management Plan (Page 1): Explain the discrepancy: Will all the compost products be used for the city internally or for retail distribution? Or only the screening rejects ("overs") will be used for the city internally?

Response: All materials selected for composting and not sent off-site will be used by the City at City owned facilities. ?

8. Page 15, §3.4, Figure 3: Confirm that the requested annual composting capacity at the proposed facility is 7,200 cubic yards, or approximately 1,607 tons per year. ✓

Response: We confirm that the permitted annual composting capacity will be up to 7200 cyds per year for this initial operation. Depending on the success of the yard waste operation, this limit may be revised via permit amendment in the future.

9. Page 21, §3.8.1: In order to determine the adequate compost-mulch inventory reduction level, provide an estimate of the annual compost-mulch consumption demand that the city of Durham's Public Works has internally.

Response: We confirm that the City will use all of the compost-mulch generated by this facility. The City may offer limited distribution to the general public should surplus composted material be available.

10. Page 23, §4.1.5: The dimensions in this section for storage piles should include the maximum pile sizes as previously listed (12' X 25'X200'). An additional method of fire prevention needs to be the monitoring of piles for excessive temperatures and the monitoring of incoming feedstocks for "hot loads."

Response: The maximum size of the proposed storage piles will be limited to 12'x25'x200'; all references to this size have been coordinated.

11. Page 28, §4.2.7: The on-site storm water from the wastewater retention pond can be used for watering a windrow if the windrow has not achieved or entered into its PFRP stage.

Response: We have been directed by the NCDENR water quality staff that use of captured stormwater is not permitted for this facility.

12. Page 29, §4.3.2: Describe how a 3-6-inch blanket of finished compost is placed over the odorous or potentially odorous windrow? Which equipment(s) will be used? How to achieve the even-thickness of the blanket over a windrow?

Response: In case of unusual odor conditions, a 6" blanket of finished compost will be distributed over the windrows for absorption of odors. This will be accomplished by using a hydrostatic mulch blower and hose to apply an even layout of compost over the piles.

13. Page 29, §4.3.2: Provide a detailed discussion in this section addressing how to minimize offensive odor at the property boundary and what kinds of corrective actions would be taken if an offensive odor crosses the property boundary.

Response: The key to controlling odors in composting is effective process control and composting management. The City of Durham will be certified as Technically Competent in Composting by the North Carolina Composting Council and will use this training to ensure minimal odors are present at the facility. To minimize the potential for an offensive odor episode, the staff will make sure that windrows stay aerobic, that no putrescible solid waste is present in the windrows, and that windrows are turned on a regular schedule consistent with the Operating Plan.

Should an off-site nuisance, odor event occur, the City will provide an emergency phone number for local residents to call. A 6" blanket of finished compost will be distributed over the windrows for absorption of odors. This will be accomplished by using a hydrostatic mulch blower and hose to apply an even layout of compost over the piles. The staff will then review operational logs and/or daily reports to determine what caused the odor event to occur.

III. Section Wastewater Management (WM)

1. WM-Page 1, §§1.0, WM-Appendix D: Explain how the surface runoff from Area A, namely the 4.4 acres of off-site surface runoff will not enter the wastewater pond. In addition, clarify

how the runoff from the area immediately adjacent to the northeast section of area B will be adequately drained.

Response: Drainage area 'A' has been revised to 3.795 acres as adjusted on Sheet C-3.1. Surface runoff from Area 'A' will be directed to an existing roadside ditch along the east edge of the gravel access drive. Special consideration has been provided at the northeast side of the access drive to ensure off-site runoff will not enter the yard waste site.

APPENDIX D
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2. WM-Page 1, §§1.0, WM-Appendix D: Confirm that adequate storm-water handling capacity is in place along the southern boundary of Area D to cut-off the inundating surface runoff from off-site higher elevation drainage areas from the south.

Response: A diversion ditch/berm has been provided along the southern edge of the yard waste site boundary to direct runoff towards the stormwater management pond.

3. WM-Page 1, §§1.0, WM-Appendix D: Provide a chart to show the acreage for each of the 4 drainage Areas A, B, C, and D.

Response: A chart has been provided on Sheet C-3.1 indicating the acreage for the individual drainage areas.

4. WM-Page 4, §§2.0, WM-Appendix D: Clarify if the stated 10.87 acres (41%) of the total (26.2 acres) site area are referred to the combined three drainage areas of B, C, and D, excluding the retention pond. Provide a chart to show the areas of drainage areas A, B, C and D, as well as the area of the retention pond at the top elevation of the embankment.

Response: As discussed, the stated 10.87 acres (41%) has been adjusted to 11.02 acres (42%). This area represents the disturbed area within the yard waste site and is not the same as the combined drainage areas of B, C & D. The disturbed area includes some fill slopes that do not contribute to the runoff volume that drains to the stormwater management pond. The combined drainage areas (B, C & D) match the drainage areas used on page 2 of the hydroflow report.

5. WM-Page 5, §§3.0, WM-Appendix D: Confirm that a 0.05-hour time increment was used to run all the *Intelisolve* hydraulic flow models for this report.

Response: The stormwater model has been updated to use the 0.05 (3-minute) time interval used for the analysis.

6. WM-Page 5, §§4.0, Wastewater Pond Design: The maximum permeability in cm/sec needs to be listed for the synthetic liner. Please note that the Division shall receive a written certification prepared by a NC Professional Engineer that the construction of the wastewater pond was completed in accordance with approved plans prior to any waste being introduced into the system.

Response: The proposed pond liner is a high density polyethylene material (HDPE) that is essentially impervious. The expected leakage for the overall pond area due to seams in the liner and other installation issues will be minimal. Due to the clay content of the in place soils, net the total leakage rate will be less than 2×10^{-7} cm/sec.

Note: Per our conversation on March 2, 2009, the following comments do not require a written response.

The following comments are for the 25-year/24-hour hydrographic summary:

7. WM-Appendix D_Page 1: Explain why the time interval is 10 minutes instead of 0.05 hour (or 3 minutes, see Comment II.6 above) as stated in the text? Please add the results from 3-minute interval runs if possible.
8. WM-Appendix D_Page 1: Provide definitions for both "Existing" and "Proposed" SCS Runoffs in the chart.
9. WM-Appendix D_Page 1: Specify the difference, in terms of initial model-running conditions, between Hyd. No. 1 and Hyd. No. 2.
10. WM-Appendix D_Page 1: Confirm that the drainage area for running both Hyd. No. 1 and Hyd. No. 2 are the same, namely, the drainage area = B + C + D = 11.77 acres.
11. WM-Appendix D_Page 1: Since there is only one pond (Pond 1) to be constructed and dealt with in the proposed project, what is *Pond 2* referred to? Provide clear description for these ponds.
12. WM-Appendix D_Page 1: What is the lowest water-level (elevation) to be maintained in the proposed retention pond, at which no water-withdrawal (the pumping-and-hauling operation) is needed?
13. WM-Appendix D_Pages 2, 3, and 5: Explain why a 0.0% slope was used to run all the computations when an up to 6% slope (WM_Page 4) is pronounced in Drainage Areas B, C, and D.
14. WM-Appendix D_Page 4, Hyd. No. 4: Re-plot the hydrograph with adjustment to show the X-axis (time penal) with the same scale (24 or 27 hours) as the previous graphs.
15. WM-Appendix D_Page 4, Hyd. No. 4: Confirm that the maximum drainage water input to the retention pond from the 11.77-acre drainage areas B, C, and D during a 25-year and 24-hour storm event is approximately 119,146 cubic feet.
16. WM-Appendix D_Page 5: Confirm that the top elevation of the embankment is 304' and that the maximum storage of the retention pond is thus 261,769 cf. Also see **Comment III-14** above.
17. WM-Appendix D_Page 5: Since the top of the berm (embankment) is at 304' (see Plan Sheet C-4.0), does the Stage-5 (at elevation 305') indicate a 1 foot available freeboard capacity? The freeboard should be depicted on the drawing.

The following comments are for the report's 100-year hydrographic summary:

18. WM-Appendix D_Page 6: Clarify the difference between Hyd. No. 1 and Hyd. No. 2, in terms of geometry and model-running conditions.

Response: The stormwater model has been modified to represent one (1) overall drainage area for the yard waste site and only one (1) stormwater management pond. ✓

19. WM-Appendix D_Page 6: As to above Comment II-10, what does "Pond 2" refer to if only one pond (Pond 1) is constructed?

Response: There is no second pond associated with this project; references to Pond 2 have been deleted from the report. ✓

20. WM-Appendix D_Page 6: What is the lowest allowed water-surface elevation at the retention pond, at or below which no pump-haul is required?

Q? Response: The stormwater management plan has been developed based on the water level in the pond to be controlled at the 25-year volume. Any accumulation above this level would be pumped and hauled to the City wastewater treatment facility. ✓ what's the elevation of the 25-year volume? 302.28'

21. WM-Appendix D_Page 6: For comparison, provide the modeling result running at a 3-minute (0.05-hour) time interval as mentioned in the text.

Response: The time interval has been adjusted as requested. ✓

Default = 1 minute

22. WM-Appendix D_Pages 7 & 8: Confirm that the modeling area is for Drainages B, C, and D, including that of the retention pond.

Response: The drainage area modeled includes areas B, C and D1. Area D2 is the surface area of the pond at the 25-year volume and a separate calculation has been made to account for rainfall directly on the pond surface.

$$Q_{D2} 100\% - 24hr = 2.2045 \text{ Acres} \times 43560 \times \frac{7''}{12} = 56,016 \text{ cft} = 2075 \text{ yd}^3$$

23. WM-Appendix D_Pages 7, 8 and 10: Explain why a 0.0% slope was used to run all the computations when an up to 6% slope (WM_Page 4) is pronounced in Drainage Areas B, C, and D.

Response: The 0.0% slope is entered into the model when using other methods of flow times within the software package. KCI has used the TR-55 method to calculate the Tc for the rainfall intensity; the TR-55 worksheet has been included with the hydroflow report on page 4.

24. WM-Appendix D_Page 9: Confirm that the maximum drainage water input to the retention pond from the 11.77-acre Drainage Areas B, C, and D during a 100-year and 24-hour storm event is approximately 171,571 cubic feet, which stands for what percentage of total precipitation in the drainage areas during the 100-year and 24-hour storm event?

Response: The maximum volume contribution from drainage areas B, C & D1 (not including the pond surface area) is 118,382 cubic feet based on the 100-year storm event. Rainfall directly on the pond surface contributes an additional 53,266 cft to the required storage volume. Using the area/capacity relationship for the pond, the maximum water elevation is calculated to be 301.00 ft. Overflow at the emergency spillway would begin for storms exceeding the 100-year design event. ✓

$$\frac{118,382}{181,143} = 65.35\%$$

25. WM-Appendix D_Page 9: What were the surface runoff (R) to the retention pond, evaporation (E), transpiration (T), and change in storage (ΔS) used in the computations?

Response: These values were not included in the hydroflow model and have been deleted from the report. ✓

26. WM-Appendix D_Page 9: Provide a preliminary engineering calculation and add a narrative to show how the City of Durham will manage to keep the water surface level in the retention pond at or below the elevation of 300'. The narrative should explain how the facility staff will regularly monitor the pond wastewater level and procedures for implementing a pump and haul.

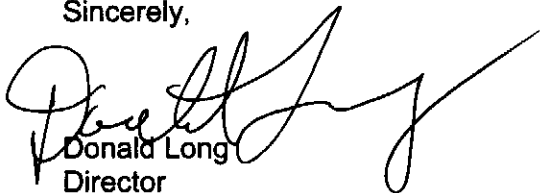
Response: A stormwater management plan will be prepared for the solid waste staff which will provide general guidance on monitoring and pumping of the pond to maintain the water level at or below the 25-volume (as shown on the design drawings). The pump and haul agreement indicates that up to 16,000 gallons per day may be pumped.

27. WM-Appendix D_Page 10: Provide details for the a10-inch diameter emergency spillway that is built at the elevation of 302.75'.

Response: The 10" dia sleeve in the concrete box is the inlet (not outlet) to this pump chamber. The box is for the pump truck when water is being withdrawn and transported to the City wastewater treatment plant. This will not be used as an emergency spillway.

If you have any questions about our response or require additional information, please let us know. You may contact our contracted engineer, Dave Koss from KCI at (919) 783-9214 or the City's Disposal Manager, Josephine Valencia at (919) 5620-4186 ext 253. You may also contact me directly at (919) 560-4186 ext 222.

Sincerely,



Donald Long
Director
Solid Waste Management Department

cc: Dave Koss, P.E., KCI Associates of NC
cc: Josephine Valencia, City of Durham, Solid Waste Disposal Manager
cc: Robert Williams, City Of Durham, Assistant Director



Michael F. Easley, Governor

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

May 1, 2008

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Donald Long
City of Durham
1833 Camden Avenue
Durham, North Carolina 27704

Subject: Return of Application Package
Permit Number WQ0032815
Durham Yard Waste Facility
Wastewater Recycling
Wake County

Dear Mr. Long:

The submitted application for the subject facility requested a closed loop recycle system permit. A closed loop recycle system is defined by Rule 15A NCAC 02T as a system in which non-domestic wastewater is repeatedly recycled back through the process in which the waste was generated. The proposed system does not contain any means of recycling the volume of waste generated by the process. Upon review of the submitted materials it has been noted that the project does not conform to the requirements of Section .1000 of 15A NCAC 02T Regulations for closed-loop recycle systems. Therefore, The Division of Water Quality cannot issue a recycle system permit to the applicant and the submitted application is being returned to the applicant.

The Division of Water Quality has determined that the surface water / compost pile seepage collected will be classified as an industrial wastewater, and therefore the generation process will be deemed permitted pursuant to paragraph (2) of Rule 15A NCAC 02T .0203. The wastewater transport from the on-site collection ponds to the City of Durham's WWTF will require a Pump and Haul permit to be issued by the Raleigh Regional Office. The construction and operation of the on-site collection ponds will be permitted under the general permit issued by the Division of Waste Management.

Your application is being returned as incomplete, in accordance with the 15A NCAC 2T .0107(b). The success of the non-discharge permitting process depends upon the receipt of complete and accurate applications. Please submit all surface water / compost pile seepage collection pond designs to the Division of Waste Management for their review. Please contact the Raleigh Regional Office to obtain the Pump and Haul permit for the facility's industrial wastewater.

One
North Carolina
Naturally

Aquifer Protection Section
Internet: www.newaterquality.org

1636 Mail Service Center
Location: 2728 Capital Boulevard

Raleigh, NC 27699-1636
Raleigh, NC 27604

Telephone: (919) 733-3221
Fax 1: (919) 715-0588
Fax 2: (919) 715-6048
Customer Service: (877) 623-6748

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N.C. Division of Water Quality

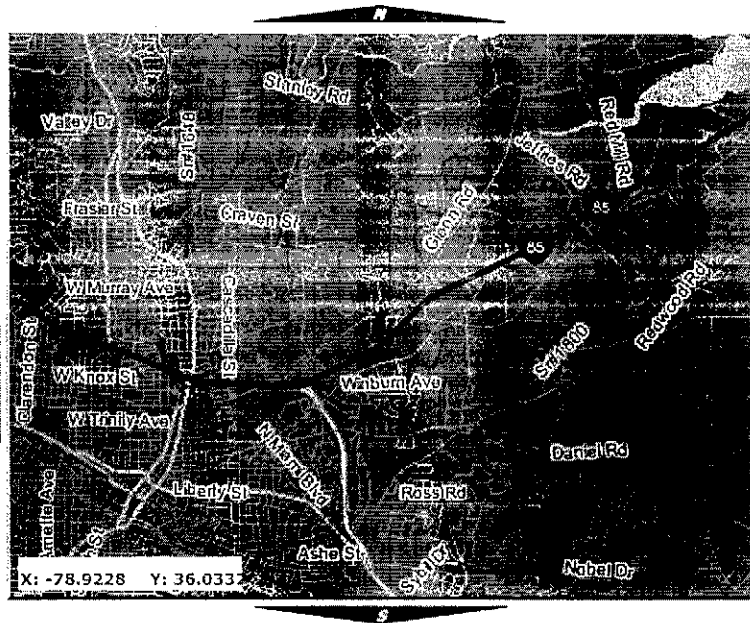
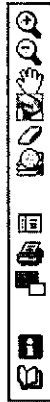
[about the division](#) | [contact us](#) | [dwq sections](#) | [glossary](#)



"To preserve, protect
and enhance
North Carolina's water..."



Address	Lat/Long	Results
Permitting :	Local	
Type:	Water Supply Watershed	
Basis:	WS-IV NSW Protected Area	
Notes:	Satisfies Phase II Requirements	
Contact:	View local contacts list	
County:	DURHAM	
DENR Region:	Raleigh	



Comments Sent

CITY OF DURHAM

**Technical Review Comments
For Solid Waste Composting Facility Permit Application
And
For the Facility's Wastewater Management Plan
Facility Permit No.: SWC-TBA**

February 23, 2009

NOTE: Please provide a response to all of the comments on a "comment for comment" basis. Where appropriate, add or revise narrative in the text of both the Permit Application and the Facility's Wastewater Management Plan that addresses the issues discussed in the comments. In addition, the comments and responses may be included as a part of the revised Permit Application and Wastewater Management Plan (e.g. in an appendix).

I. General

1. Both the Permit Application and the facility's Wastewater Management Plan are considered engineering documents; therefore, the front page or cover of the documents should be signed, dated and sealed by an engineer licensed to practice in North Carolina. The signee is responsible for the enclosure of other related engineering work in the documents, such as the facility's Operation & Maintenance Manual, and facility sizing report if these segmented engineering reports are not originally signed, dated and sealed.

II. Permit To Operate Application

1. Page 1, §1.1: Correct the typographical error – fill the missing word "permit" - in the last sentence.
2. Page 1, § 1.3: The threshold between a small and large type I facility is 6,000 cubic yards of material per quarter (.1402(f)(7)).
3. Page 1, §1.3.1: There is no such area plan with a scale of 1" = 175' in the submittal package.
4. Page 1, §1.3.1: Add scale, legend, and true north in Figure 1. The scale shall be less than or equal to 1 inch: 400 feet. On the scaled drawing (plan), show the location of all homes, wells, industrial buildings, public or private utilities, roads, watercourses, dry runs, and other applicable information regarding the general topography within 500 feet of the proposed facility.

5. Page 1, §1.3.2, and Figure 2: Provide the total acreages for the areas within the so-called “Waste Management Unit (WMU) Boundary” and the “*Site-Development Boundary*”.
6. Page 2, §1.3.4, Area Plan: Denote the well(s) on the plan.
7. Page 4, §1.3.9, Figure 3 (Page 15), §3.4.4, Wastewater Management Plan (Page 1): Explain the discrepancy: Will all the compost products be used for the city internally or for retail distribution? Or only the screening rejects (“overs”) will be used for the city internally?
8. Page 15, §3.4, Figure 3: Confirm that the requested annual composting capacity at the proposed facility is 7,200 cubic yards, or approximately 1,607 tons per year.
9. Page 21, §3.8.1: In order to determine the adequate compost-mulch inventory reduction level, provide an estimate of the annual compost-mulch consumption demand that the city of Durham’s Public Works has internally.
10. Page 23, §4.1.5: The dimensions in this section for storage piles should include the maximum pile sizes as previously listed (12’ X 25’X200’). An additional method of fire prevention needs to be the monitoring of piles for excessive temperatures and the monitoring of incoming feedstocks for “hot loads.”
11. Page 28, §4.2.7: The on-site storm water from the wastewater retention pond can be used for watering a windrow if the windrow has not achieved or entered into its PFRP stage.
12. Page 29, §4.3.2: Describe how a 3-6-inch blanket of finished compost is placed over the odorous or potentially odorous windrow? Which equipment(s) will be used? How to achieve the even-thickness of the blanket over a windrow?
13. Page 29, §4.3.2: Provide a detailed discussion in this section addressing how to minimize offensive odor at the property boundary and what kinds of corrective actions would be taken if an offensive odor crosses the property boundary.

III. Section Wastewater Management (WM)

1. WM-Page 1, §§1.0, WM-Appendix D: Explain how the surface runoff from *Area A*, namely the 4.4 acres of off-site surface runoff will not enter the wastewater pond. In addition, clarify how the runoff from the area immediately adjacent to the northeast section of area B will be adequately drained.
2. WM-Page 1, §§1.0, WM-Appendix D: Confirm that adequate storm-water handling capacity is in place along the southern boundary of *Area D* to cut-off the

inundating surface runoff from off-site higher elevation drainage areas from the south.

3. WM-Page 1, §§1.0, WM-Appendix D: Provide a chart to show the acreage for each of the 4 drainage Areas A, B, C, and D.
4. WM-Page 4, §§2.0, WM-Appendix D: Clarify if the stated 10.87 acres (41%) of the total (26.2 acres) site area are referred to the combined three drainage areas of B, C, and D, *excluding* the retention pond. Provide a chart to show the areas of drainage areas A, B, C and D, as well as the area of the retention pond at the top elevation of the embankment.
5. WM-Page 5, §§3.0, WM-Appendix D: Confirm that a 0.05-hour time increment was used to run all the *Intelisolve* hydraulic flow models for this report.
6. WM-Page 5, §§4.0, Wastewater Pond Design: The maximum permeability in cm/sec needs to be listed for the synthetic liner. Please note that the Division shall receive a written certification prepared by a NC Professional Engineer that the construction of the wastewater pond was completed in accordance with approved plans prior to any waste being introduced into the system.

The following comments are for the 25-year/24-hour hydrographic summary:

7. WM-Appendix D Page 1: Explain why the time interval is 10 minutes instead of 0.05 hour (or 3 minutes, see Comment II.6 above) as stated in the text? Please add the results from 3-minute interval runs if possible.
8. WM-Appendix D Page 1: Provide definitions for both “Existing” and “Proposed” SCS Runoffs in the chart.
9. WM-Appendix D Page 1: Specify the difference, in terms of initial model-running conditions, between Hyd. No. 1 and Hyd. No. 2.
10. WM-Appendix D Page 1: Confirm that the drainage area for running both Hyd. No. 1 and Hyd. No. 2 are the same, namely, the drainage area = $B + C + D = 11.77$ acres.
11. WM-Appendix D Page 1: Since there is only one pond (Pond 1) to be constructed and dealt with in the proposed project, what is *Pond 2* referred to? Provide clear description for these ponds.
12. WM-Appendix D Page 1: What is the lowest water-level (elevation) to be maintained in the proposed retention pond, at which no water-withdrawal (the pumping-and-hauling operation) is needed?

13. WM-Appendix D_Pages 2, 3, and 5: Explain why a 0.0% slope was used to run all the computations when an up to 6% slope (WM_Page 4) is pronounced in Drainage Areas B, C, and D.
14. WM-Appendix D_Page 4, Hyd. No. 4: Re-plot the hydrograph with adjustment to show the X-axis (time penal) with the same scale (24 or 27 hours) as the previous graphs.
15. WM-Appendix D_Page 4, Hyd. No. 4: Confirm that the maximum drainage water input to the retention pond from the 11.77-acre drainage areas B, C, and D during a 25-year and 24-hour storm event is approximately 119,146 cubic feet.
16. WM-Appendix D_Page 5: Confirm that the top elevation of the embankment is 304' and that the maximum storage of the retention pond is thus 261,769 cf. Also see **Comment III-14** above.
17. WM-Appendix D_Page 5: Since the top of the berm (embankment) is at 304' (see Plan Sheet C-4.0), does the Stage-5 (at elevation 305') indicate a 1 foot available freeboard capacity? The freeboard should be depicted on the drawing.

The following comments are for the report's 100-year hydrographic summary:

18. WM-Appendix D_Page 6: Clarify the difference between Hyd. No. 1 and Hyd. No. 2, in terms of geometry and model-running conditions.
19. WM-Appendix D_Page 6: As to above Comment II-10, what does "*Pond 2*" refer to if only one pond (*Pond 1*) is constructed?
20. WM-Appendix D_Page 6: What is the lowest allowed water-surface elevation at the retention pond, at or below which no pump-haul is required? ←
21. WM-Appendix D_Page 6: For comparison, provide the modeling result running at a 3-minute (0.05-hour) time interval as mentioned in the text.
22. WM-Appendix D_Pages 7 & 8: Confirm that the modeling area is for Drainages B, C, and D, including that of the retention pond.
23. WM-Appendix D_Pages 7, 8 and 10: Explain why a 0.0% slope was used to run all the computations when an up to 6% slope (WM_Page 4) is pronounced in Drainage Areas B, C, and D.
24. WM-Appendix D_Page 9: Confirm that the maximum drainage water input to the retention pond from the 11.77-acre Drainage Areas B, C, and D during a 100-year and 24-hour storm event is approximately 171,571 cubic feet, which stands for what percentage of total precipitation in the drainage areas during the 100-year and 24-hour storm event?

25. WM-Appendix D_Page 9: What were the surface runoff (R) to the retention pond, evaporation (E), transpiration (T), and change in storage (ΔS) used in the computations?
26. WM-Appendix D_Page 9: Provide a preliminary engineering calculation and add a narrative to show how the City of Durham will manage to keep the water surface level in the retention pond at or below the elevation of 300'. The narrative should explain how the facility staff will regularly monitor the pond wastewater level and procedures for implementing a pump and haul.
27. WM-Appendix D_Page 10: Provide details for the a10-inch diameter emergency spillway that is built at the elevation of 302.75'.

----- End of Comments -----

CITY OF DURHAM

Technical Review Comments For Solid Waste Composting Facility Permit Application And For the Facility's Wastewater Management Plan Facility Permit No.: SWC-TBA

March 23, 2009

I. General

1. Both the Permit Application and the facility's Wastewater Management Plan are considered engineering documents; therefore, the front page or cover of the documents should be signed, dated and sealed by an engineer licensed to practice in North Carolina. The signee is responsible for the enclosure of other related engineering work in the documents, such as the facility's Operation & Maintenance Manual, and facility sizing report if these segmented engineering reports are not originally signed, dated and sealed.

II. Permit To Operate Application

III. Section Wastewater Management (WM)

Additional-1: WM-Appendix D: The freeboard should be depicted on the drawing.

20. WM-Appendix D Page 6: What is the lowest allowed water-surface elevation at the retention pond, at or below which no pump-haul is required?

March 13, 2009 City of Durham Technical Responses (Rsp): *"The stormwater management plan has been developed based on the water level in the pond to be controlled at the 25-year volume. Any accumulation above this level would be pumped and hauled to the City wastewater treatment plant."*

Additional-2: From both operational and compliance points of view (given that the elevation for the 100-year/24-hour storm was determined by the city (**Rsp III-24**) to be 301.00 ft), confirm that the elevation of the water surface in the Pond in a 25-year storm event is 299 ft.

24. WM-Appendix D_Page 9: Confirm that the maximum drainage water input to the retention pond from the 11.77-acre Drainage Areas B, C, and D during a 100-year and 24-hour storm event is approximately 171,571 cubic feet, which stands for what percentage of total precipitation in the drainage areas during the 100-year and 24-hour storm event?

March 13, 2009 City of Durham Technical Response: "... ... Using the area/capacity relationship for the pond, the maximum water elevation is calculated to be **301.00 ft**. Overflow at the emergency spillway would begin for storms exceeding the 100-year design event."

Additional-3: Wastewater Management Plan (March 13, 2009 Submittal on Page 5, §§4.0:) states that "... The emergency spillway of the (retention) Pond will be set at (the elevation of) **303'**, which is 0.18' above the 100-yr water surface elevation in the pond." Explain the discrepancy in the water surface elevation in the 100-year storm event. Furthermore, if the maximum water level elevation) in the pond for a 100-year storm event is only around 301 ft (see item **Rsp II-20** above), why should the emergency spillway is set at **302.75 ft**?

----- End of Additional Comments -----

DURHAM



1869
CITY OF MEDICINE

CITY OF DURHAM

DEPARTMENT OF WATER MANAGEMENT
101 CITY HALL PLAZA • DURHAM, NC 27701

AUTHORIZATION to DISCHARGE

**City of Durham Yard Waste Compost Facility
1833 Camden Avenue, Durham NC 27704**

is hereby granted permission to discharge wastewater (storm water run-off) into City's North Durham Water Reclamation Facility. This discharge shall typically be allowed between the hours of 7:30 a.m. and 4:30 p.m., Monday through Friday. Permission to discharge is restricted to waste from the storm water detention pond on site. The maximum discharge volume per week is expected to be no more than 16,600 gallons per week.

The City of Durham Yard Waste Compost Facility shall comply with all provisions of City of Durham's Sewer Use Ordinance. If any provision of the City's Sewer Use Ordinance is violated, this authorization may be terminated.

Fee assessment and waste determinations may be required at the discretion of the City of Durham, Department of Water Management.

This authorization shall be valid until midnight on December 31, 2009 and is subject to annual renewal.

John Dodson, Superintendent
North Durham Water Reclamation Facility
1900 East Club Boulevard
Durham, North Carolina 27704
(919) 560-4384

North Carolina Department of Environment and Natural Resources
Division of Water Quality
Raleigh Regional Office

(THIS FORM MAY BE PHOTOCOPIED FOR USE AS AN ORIGINAL)

PUMP AND HAUL OF INDUSTRIAL WASTEWATER

I. GENERAL INFORMATION:

1. Applicant (corporation, individual, other): City of Durham Solid Waste
2. Print owner or signing official name and title (the person who is legally responsible for the facility and its compliance): DONALD LONG, DIRECTOR
SOLID WASTE MANAGEMENT
3. Mailing address: 1833 CAMDEN AVE. DURHAM, NC 27704

Telephone no.: (919)-560-4186
4. Project name (facility or establishment name):
Yard Waste Composting Facility (YWCF)
5. Application date:
6. County where facility being pumped is located: Durham
7. Specify whether the applicant is: X public or private.

II. INFORMATION ON WASTEWATER:

1. Please provide a short description specifying the origin of the wastewater, such as school, hospital, commercial, etc.: Runoff from YWCF
2. Volume of wastewater to be pumped and hauled: 16,000 gallons per day
3. Explanation of how wastewater volume was determined:

III. TREATMENT FACILITY INFORMATION:

1. Name of treatment facility receiving wastewater: North Durham Water Reclamation Facility
2. Treatment facility NPDES permit no.: NC0023841
3. Treatment facility contact person and telephone no.: John Dodson, (919) 560-4384
4. County where treatment facility is located: Durham

IV. OTHER INFORMATION:

1. Brief project description: _____

2. Explanation of why pump and haul is being requested: _____

3. Specify how long pump and haul will be needed: _____
4. Describe how the wastewater will be transported (truck, rail car, etc.) and provide the typical hauling volume of the vehicle providing the hauling: _____
Transported by City owned 6,000 gallon tanker truck
5. Name of owner/company of transporting (hauler) vehicle: _____
City of Durham, Department of Water Management,
6. Mailing address of hauler: 1600 Mist Lake Dr. Durham

Telephone no. of hauler: 919-560-4388

7. What type of tank or container will the wastewater be pumped from and what is the volume of this container: _____
8. Is the tank or container already in place or will it be installed for these activities?

9. What type of high water alarm(s) does the container have?
_____ audible and visual _____ auto dialer

PLEASE ENSURE THAT THE FOLLOWING INFORMATION IS PROVIDED AND THAT THE FOLLOWING ISSUES ARE ADDRESSED

- a. Provide this completed and signed form.
- b. It is the current policy of the Division of Water Quality that a permit is not required for pump and haul of industrial wastewater; **however, the regional office must approve such pumping and hauling. The owner and engineer, by signing this application, affirm that the conditions under which this pump and haul activity are to be conducted are in full compliance with North Carolina Administrative Code (NCAC), Title 15A NCAC .02T .0200.**
- c. A fee is not currently required for approval to pump and haul industrial wastewater.
- d. Two sets of detailed plans/specifications signed and sealed by a North Carolina Professional Engineer must be provided, showing the components associated with the pump and haul activity (drains, piping, tanks, etc.), a general location map, a plan view of the storage facility and its relationship to property lines, structures, etc. The tank detail should indicate the high water alarm (either audible and visual or an auto dialer). Each sheet of the plans and the first page of the specifications must be signed/sealed by the Professional Engineer.
- e. A letter must be provided from the owner/authority of the receiving wastewater treatment facility stating that the pumped and hauled wastewater will be accepted and specifying the volume of wastewater that will be accepted.
- f. A letter or contract from the hauler stating his capability and willingness to perform the pumping and hauling.
- g. Please provide a cover letter explaining the circumstances associated with this pump and haul request.

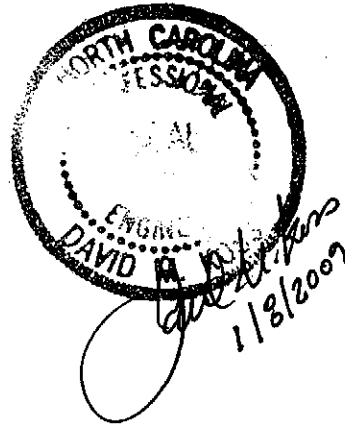
Name and address of engineering firm: KCI ASSOCIATES OF NC

4601 SIX FORKS ROAD, SUITE 220

RALPHIGH, NC 27609

Telephone no.: (919) 278-2468 Fax No. (919) 783-9266

North Carolina Professional Engineer Seal, Signature and Date:



Applicant's Certification:

I, CITY OF DURHAM, attest that this request for _____
(print owner name)
YARD WASTE FACILITY
(print name of facility)

has been reviewed by me and is complete to the best of my knowledge. I understand that if all required parts of this document are not completed and that if all required supporting information and attachments are not included, this package will be returned as incomplete.

Signature: [Signature] Date: 1/8/2009

**SEND THE COMPLETED PUMP AND HAUL APPLICATION WITH
ATTACHMENTS TO THE FOLLOWING MAIL ADDRESS**

**DWQ Surface Water Protection Supervisor
Department of Environment and Natural Resources
1628 Mail Service Center
Raleigh, N. C. 27699-1628
Telephone No.: 919-791-4200**

DURHAM



CITY OF DURHAM

Department of Solid Waste Management

101 CITY HALL PLAZA 27701

1833 CAMDEN AVENUE | DURHAM, NC 27704

919.560.4186 | F 919.560.4647

1 8 6 9
CITY OF MEDICINE

www.durhamnc.gov

January 8, 2009

NCDENR – Division of Waste Management
Composting & Land Applications Branch
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Attn: Mr. Michael Scott

Durham Yard Waste Facility Permit
Final Report



Dear Mr. Scott:

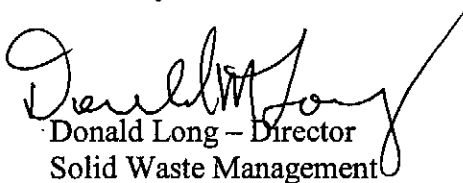
Based on the May 16, 2008 comments and our meeting of August 26, 2008, we have revised the yard waste facility permit as follows:

- 1) Division of Water Quality – In order to satisfy the zero discharge requirement, the design of this facility includes a large stormwater detention pond that has been sized to collect all of the stormwater runoff from the 100-year rainfall event. When required, wastewater from the on-site pond will be hauled via tanker truck to the City's wastewater treatment plant. Attached is an authorization to discharge letter from the City's Water Resources Department.
- 2) The calculations for the collection and storage of the 100-year rainfall event are enclosed.
- 3) We have obtained a permit from the Division of Land Quality associated with erosion control during construction.
- 4) The permit application has been revised to require that grinding of yard waste occur no less than once per week. Yard waste that scheduled for composting will be hauled off-site for disposal.
- 5) The permit application has been revised to discuss changes to the composting process based on the composition of the incoming waste.

- 6) The enclosed site plan describes areas for each of the steps in the composting process along with the size/volumes for each stage of the process. The volume of material to be made available for composting has been significantly reduced based on the stormwater management plan.
- 7) Section 3.6.5 has been expanded to address vector problems and the plans to control problems during the composting process.
- 8) To address the water quality issues associated with moisture control, the City will make arrangement is install a local fire hydrant at the yard waste site to provide a source of potable water. Water from the stormwater pond will not be used for irrigation.
- 9) Section 3.7.3 has been expanded to include specific sampling frequency for pathogens and other foreign matter. None of the composted yard waste is expected to be made available to the general public and will not be bagged for distribution. Composted materials will only be used for City Owned facilities.
- 10) The composting process has been modified to provide guidelines for product handling for materials that do not meet quality standards.
- 11) The commitments for record keeping have been expanded as requested.
- 12) A site maintenance section has been added to the permit application.

The revised permit application, final construction drawings, calculations, erosion control permit, and the required pump & haul permit are included. If you have any questions or need additional information, please let us know.

Sincerely,


Donald Long – Director
Solid Waste Management



North Carolina Department of Environment and Natural Resources

Division of Land Resources

Land Quality Section

James D. Simons, PG, PE
Director and State Geologist

Michael F. Easley, Governor
William G. Ross, Jr., Secretary

November 20, 2008

LETTER OF APPROVAL

City of Durham
ATTN :- Donald Long
1833 Camden Avenue
Durham, NC 27704



RE: Project Name: Durham Yard Waste Facility Upgrade
Project ID: DURHA-2009-004 Acres Approved: 10.87
County: Durham, 2115 E. Club Blvd, Durham
River Basin: Neuse Stream Classification: Other
Submitted By: Frederic Rash, KCI Associates of NC, PA
Date Received by LQS: 10/6/08; 11/18/08
Plan Type: New

Dear Sir or Madam:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable and hereby issue this Letter of Approval. The enclosed Certificate of Approval must be posted at the job site. This plan approval shall expire three (3) years following the date of approval, if no land-disturbing activity has been undertaken, as is required by Title 15A NCAC 4B .0129.

Title 15A NCAC 4B .0118(a) requires that a copy of the approved erosion control plan be on file at the job site. Also, this letter gives the notice required by G.S. 113A-61.1(a) of our right of periodic inspection to insure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Act is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project, the erosion and sedimentation control plan is inadequate to meet the requirements of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statute 113A-51 through 66), this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State

Letter of Approval
Project :- Durham Yard Waste Facility Upgrade
November 20, 2008
Page 2 of 2

water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCG010000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Due to the location of this project, it should be noted that a rule to protect and maintain existing buffers along watercourses in the Neuse River Basin became effective on July 22, 1997. The Neuse River Riparian Area Protection and Maintenance Rule (15A NCAC 2B .0233) applies to all perennial and intermittent streams, lakes, ponds and estuaries in the Neuse River Basin with existing vegetation on the adjacent land or "riparian area". In riparian areas with existing vegetation in the first 30 feet directly adjacent to the stream, the rule prohibits land disturbance or new development within the first 30 feet of land next to the water (the remaining 20 feet of the total buffer must be revegetated upon completion of any proposed land-disturbing activity). In riparian areas with existing vegetation that is less than 30 feet wide, the rule prohibits land disturbance or new development within the area that contains the existing vegetation (but not the entire 50 foot riparian area). For more information about this riparian area rule, please contact the Division of Water Quality's Wetland/401 Unit at 919-733-1786, or a Division of Water Quality representative at this regional office.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you provided. You are requested to file an amended form if there is any change in the information included on the form. In addition, it would be helpful if you notify this office of the proposed starting date for this project. Please notify us if you plan to have a preconstruction conference.

Your cooperation is appreciated.

Sincerely,



Karyn Pageau, EIT, CPESC
Assistant Regional Engineer
Land Quality Section

Enclosures: Certificate of Approval
NPDES Permit

cc: Frederic Rash, KCI Associates of NC, PA, 4601 Six Forks Road, Landmark Center II, Suite 220, Raleigh, NC 27609

Danny Smith, NC DWQ - SWP Supervisor, Raleigh Regional Office